SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

JANUARY, 1953

VOL. VII NO. 1

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Arizona Cactus and Native Flora Society

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Volume 7 JANUARY, 1953 No. I

Table of Contents

Front Cover Picture Jardin Exotique .....
Editorial 3
Schedule Cactus Show 3
Jardin Exotique de Monaco 6
Echinocereus ferreirianus species nova 8

Desert Botanical Garden of Arizona

STAFF

Director .....W. Taylor Marshall
Chief Horitculturist .....W. Hubert Earle
Junior Botanist .....E. R. (Jim) Blakley

Garden hours: October to April inclusive, open 10 A.M. to 5 P.M. daily and Sunday. Closed every Monday. Lectures on Sunday at 3 PM. and 4 PM.

Editorial

The Sixth Annual Cactus Show will be held in our administration building from noon February 22 to 5 p.m. on Sunday March 1st, and all of our efforts are diverted to its planning.

We have prepared new schedules of entries which we believe will create greater competition and make for a better show. The new schedule is printed in this issue of the Bulletin.

We will have immense crowds all of the eight days of the show and we will need all of the volunteer help we can get. If you can spare us a day or even part of a day please get in touch with us. The work is largely protective and you will be assigned a section of the show to watch for pilfering or destruction of exhibits.

Our amateur group, The Cactomaniacs, as well as members of both our Thursday afternoon and Monday evening classes are planning to exhibit in the show and their accent will be on educational exhibits.

We ask all of our members in Arizona to enter one or more of their best plants in our show. If you have never done so before you will get a great kick out of showing.

Our attention has been called to greatly increased activities on the part of cactus dealers, one of whom is reported to be digging up truck loads of plants and selling them door to door.

We are pleased to report that the Paradise Valley Improvement Association has noted this activity and intend to get evidence for the prosecution of this vandal and possibly of the purchasers of illegal plants.

Sixth Annual Cactus Show

February 22nd to March 1st, 1953

Administration Building

Desert Botanical Garden

Entries can be placed in space assigned after 1 P.M. Saturday, February 21st or before 10 A.M. Sunday February 22nd. Exhibits can be removed Sunday March 1st after 5 P.M. or on Monday, March 22nd. For additional information telephone AM 5-1815.

Exhibits open to the public

12 Noon Sunday, February 22nd, 1953

Daily to March 1st, 10 A.M. to 5 P.M.

No admission charge

Schedule of Classifications

SECTION "A" POTTED SPECIMEN PLANTS

1. One species of cactus
2. Seeding cactus
3. Grafted Cactus
4. Crested Cactus — own root
5. One species of a Succulent plant other than Cactus
6. Desert Trees and Shrubs. One species potted.

SECTION "B". COLLECTIONS OF POTTED PLANTS

1. Cacti, at least five species
2. Other Succulents, at least five species
3. Desert trees or shrubs, at least five species
4. Cacti, ten species or more
5. Succulents, ten species or more
6. Collection of 5 plants of one genus-Cactus
7. Collection of 5 plants of one genus — Succulents
8. Collection of over 5 plants of one genus — Cactus
9. Collection of over 5 plants of one genus—Succulents
10. Collection of Cactus Grafts
11. Collection of Chollas
12. Collection of Prickly pears
13. Collection of Echinocereus
14. Collection of Barrels
15. Collection of Mammallarias
16. Collection of Coryphanthas
17. Collection of Epipyllums
18. Collection of Cereanae
19. Collection of Echinopsis
20. Collection of Lobivias & Rebutas

SECTION "C". DISH GARDENS (Accessories Permitted)

1. Dish garden under 8" —Cactus
2. Dish garden under 8" — Succulents
3. Dish garden under 8" — Cactus & Succulents
4. Dish garden over 8½" — Cactus
5. Dish garden over 8½" — Succulents
6. Dish garden over 8½" — Cactus & Succulents
7. Miniature Cacti in containers
8. Hanging Basket
9. Strawberry Jar 14" or less
10. Junior entries by schools

SECTION "D". ARRANGEMENTS WITH ACCESSORIES

1. Cacti for centerpiece
2. Succulents for centerpiece
3. Cacti and Succulents for centerpiece
4. Cacti with garden flowers as accessories
5. Succulents with garden flowers as accessories
6. Cacti, American Indian influence
7. Corsage of Succulents
8. Terrarium
9. Novelty container with Cacti
10. Novelty container with Succulents
11. Novelty container with Cacti and Succulents
12. Button gardens
13. Arrangement with Dried Material
14. Miniature arrangements

SECTION "E". ROCK GARDENS. (Entries open to individuals, Garden Clubs and organizations; space must be reserved in advance)

1. Rock garden, not over 9 square feet

2. Rock garden over 10 square feet

SECTION "F"

1. Educational exhibits
2. Book exhibits
3. Water Colors — Oils — Pen & Ink

Judges Scale of Points:

Maturity and condition of plant	30
Number of species in a collection	30
Staging	15
Correct labeling	25
	100

JARDIN EXOTIQUE de MONACO

Our garden is unique in that it is the only Botanical Garden in the world, in so far as we know, which is exclusively devoted to desert vegetation including the succulents and all trees, shrubs and grasses.

There are several outstanding Gardens which specialize in succulent

Jardin Exotique de Monaco photo
View of Mediterranean from a garden walk

View of Jardin Exotique
Photographs from those gardens.

plants, and one of the best of them is the Jardin Exotique in the Principality of Monaco.

This garden is laid out on the cliffs facing the Mediterranean and overlooking the municipal buildings and the casino of Monte Carlo.

We have been corresponding with the Director of the Jardin Exotique for some years and have sent them a few seeds. Recently Rupe Leach, director of photography for Sawyer's of Portland, Oregon, makers of Viewmasters and reels, sent me two reels of 7 pictures each that he had taken on a visit to Monaco.

We were therefore much interested in a letter recently received from Mr. L. Vatrican, the Director of that garden and to find that he has troubles just as we have. We thought you would like to read his letter so we print herewith a translation from the French by Mrs. Marshall.

Mairie de Monaco
16 December 1952

Dear Mr. Marshall

I always receive with great pleasure your Saguaroland Bulletin, Thank you. It allows me to follow the progress of your garden and I want to extend to you my warmest congratulations.

If I did not have an enormous amount of work I would write more often but my garden, as you must know, leaves me very little leisure as I am alone to accomplish many tasks.

The November number has just arrived and, as rarely occurs, I have a free moment and want to use it to send you some news of our garden.

We, also, are having great success. Visitors to our garden passed the 20,000 mark on the opening of the garden in 1933 and about 350,000 for this year.

Some days we have more than 4,000 visitors which is a lot considering the narrowness of our walks.

This large attendance hinders us in upkeep and improvement work to my great worry. The Landscape Architect who constructed the garden had not foreseen the great development of our plants and the pockets he constructed for soil in which to grow them are generally not large enough to nourish them now. I must therefore take out the rock work and rebuild it to get more root room.

This is not easy as some of the rocks weigh more than a ton. On the other hand this rebuilding of the pockets enables us, at the same time, to replace the depleted soil, with a fresh soil with the compost necessary for Cactus and the other Succulents. The increased health of the plants compensates for all the work.

In your November Bulletin I was greatly amused by the article about the cover picture. In our garden epiphytes develop on our large cereus plants. It is sufficient for a little soil to accumulate in the crotch of a branch and for a seed to be deposited therein by a bird and the next rain or heavy mist causes germination.

It may be an Opuntia, a Cereus or a Selenicereus and I have even seen a Tillandsia epiphytic on Opuntia ficus indica. Usually after a year or two of growth the epiphyte dies and its decomposition will serve as humus for another epiphyte.

The lack of soil gives these epiphytes an attenuated growth as you mentioned in your Bulletin when you spoke of mistaking an epiphytic Rathbunia for an Aporocactus.

We also have in our garden spontaneous vegetation in the rock crevices of our cliffs and these plants develop and usually survive according to the amount of humus they find. Some of the spontaneous plants were here in 1935 when I first came here but they remain the same size and some of them flower a little.

With best wishes for Christmas and the New Year and with fraternal sentiments.

L. Vatrican

Echinocereus Ferreirianus Spec. Nova

Howard E. Gates

A caespitose cactus which forms clumps to 30 cm. in height and diameter; roots fiberous; each branch soon forming its own roots; branches 6 to 8 cm. in diameter, columnar, tapering slightly to a rounded apex, olive green, under exposure assuming a brown, red or purple coloration; ribs 9 to 13, usually 11 or 12, low, obtuse and divided into low, rounded tubercles separated by lines of greener color; areoles 1 to 1.5 cm. apart, circular, gray felted; radial spines 9 to 13, about 1 cm. long, acicular, appressed, widely divergent, gray to brown,, occasionally with dark tips; central spines usually 3, the lower one porrect to deflexed, up to 5 cm. long, the upper ones ascending, shorter; all central spines acicular, bulbose at base, light gray at base and shading through brown to purple-black tips.

Flowers in early summer, diurnal and closing at night for about 5 successive days, borne near apex of stems, funnelform, 5.5 to 6 cm. long, 4 cm. in diameter; ovary ovate, green to reddish-brown, with areoles 1 to 2 cm. apart bearing white wool and 6 to 9 acicular spines with bulbose bases, 2 to 10 mm. long, white to cream with brown tips; tube 2 to 2.5cm. long, bearing acuminate, brown to reddish-purple scales which subtend white to cream

Echinocereus ferreirianus Gates

colored spines in their axils; outer perianth segments about 16, acuminate, entire; inner perianth segments about 33, oblanceolate, apiculate, entire, outer surface pale purple, inner surface rose pink abruptly changing to orange on the lower one third; filaments numerous, light purple at base, golden above, included; anthers yellow; style cylindrical, slightly ribbed above, white to cream, included but longer than the stamens; stigma lobes 8 or 10, white to cream (chrysolite green on plants grown in Arizona), linear; fruit globose 4 cm. long, 3.5 cm. in diameter, olive green sometimes purple tinged; areoles on fruit 1 cm. apart, orbicular, bearing 6 to 12 white to light gray, acicular spines; a thin, soft skin covers soft, white pulp; seeds numerous, dull black, punctate, more than 1mm. long.

Type locality:—Piojo Islet, Smith Island Group, Los Angeles Bay, Baja California, Mexico.

Distribution:—Islands and Mountains around Los Angeles Bay. One collec-

tion was made sixty miles south, midway between Calmalli and the Gulf. Type of Species has been deposited in Dudley Herbarium of Stanford University.

The species is named to honor Senor Enrique Ferreira, former Consul of Mexico at San Diego, California, whose kindly cooperation greatly faciliated the author's many exploring trips into Lower California.

This is a very attractive plant even though the name of its island home means "louse" in Spanish. The unusual combination of pink petals, orange throat, yellow stamens and light pistil, makes this one of the most beautiful flowers in the large genus Echinocereus which is noted for outstanding flowers.

It is usually found in rather heavy soil between rocks in one of the hottest and driest sections of Lower California. Nevertheless it responds readily to cultivation and a small number of plants have been grown in California since it was discovered and collected by the author in 1934.

Editors note: This species has been grown in the Desert Botanical Garden for ten years very successfully and has proved easier of culture than many other species of the genus. The stigma lobes on our plants are always chrysolite green, a very light green, and none have been ivory colored as noted by Mr. Gates. We have had hundreds of flowers to observe.

LATIN DESCRIPTION OF ECHINOCEREUS FERREIRIANUS

Translation by Dr. L. Parker

Cactus caespitosus glaebas formans usque ad 30 cm altitudinis lineaeque media; rami 6 - 8 cm in linea media, parvi momenti reducentes ad apicem; costae 9-13 de numero, inferiores, obtusae, tuberculis inferioribus rotundis superatae; spinae radiales 9-13 in numero, circa 2 cm. longae, aciculares, radiantes, de colore grieso ad coloreum fuscum, nonnumquam cum cacumine fusciori; spinae centrales plerumque 3-5 cm longae, quarum spina inferior longissima, porrecta usque ad deflectatum, quarumque duae superiores ascendentes, breviores, omnes com basi bulbosa, aciculares, de colore griseo cum cacuminibus fuscis; flores diurnales, 5.5-6 cm longi, 4 cm de linea media, infundibulum formantes; ovarium spinosum, 2 cm longum oviforme; segmenta perianthi exterioris 16 de numero, in duis ordinibus, acuminata, tota, de colore fusco ad purpureum roseum; segmenta interiores perianthi apiculata, tota, superficies interior rosea, subito commutans in aurantium in parte tertia inferiori sua; laminae stigmatis palido-eburneae ad palido-virides; fructus globosus, spinosus; semina arido-nigra, punctata.

OTHER NEW SPECIES

The French Journal "Cactus" published by L'Association Francaise des Amateurs de Cactees et Plantes Grasses in its December 1952 issue publishes the following new Cactus species by Prof. Martin Cardenas:—

Rhipsalis incachacana, Acanthorhipsalis paranganiensis, Opuntia ipatiana all from Bolivia.

Prof. Cardenas has recently published a great number of new species, possibly more than are justified under a conservative evaluation of specific differences.

The tendency to split species on very insignificant characters seems to be an inevitable result of intensive study of the vegetation of any restricted territory rather than an evaluation based on the great variations in species with a wide range due to altitude and geographical situations.

Echinocereus ferreirianus Gates
Showing the orange colored eye of the flower

Desert Botanical Garden

Book Dept. P. O. Box 647 Tempe, Ariz.

PACKAGED CACTUS PLANTS

Attractive packages with cut cellophane packing.

		Price	Postage*
No. 1	5 year old Saguaro Seedling 2" high	.50	.10
No. 5	5 plants	1.00	.30
No. 10	10 plants	1.50	.40
No. 10W	10 white spined plants, collectors items	3.00	.40
No. 15	15 larger plants	2.50	.50
No. 16	16 still larger plants	4.50	.60
No. 24	24 large plants many of flowering size	7.00	1.00

BOOK SUGGESTIONS:—

	Price	Postage*
Arizona's Cactuses; Marshall paper binding	1.00	.15
cloth binding	2.00	.20
A description of all of the species native to Arizona. 60 ills.		
Flowers of the Southwestern Desert—Dodge	1.00	.15
Flowers of the Southwestern Mesas—Patraw	1.00	.15
Flowers of the Southwestern Mountains—Arnberger	1.00	.15
Poems of the Desert by Lou Ella Archer. Cloth bound, beautifully illustrated in color		
Canyon Shadows	2.00	.10
Sonnets to the Southwest	2.00	.10

Gift Suggestions

	Price	Postage
Prickly Pear Delight— A Turkish delight type of confection made from prickly pear cactus fruits, provocative flavor		
½ pound box	.80	.20
1 pound box	1.50	.30
Prickly Pear Jelly— 4-12 oz glasses in shipping carton. A clear red jelly of exceptional flavor	2.20	.80

* Postage and wrapping charges.

NEW YEAR SUGGESTIONS

A membership in the Garden which includes a year's subscription to Saguaroland Bulletin.

Succulent Plants — Marshall 12.30*

Including a viewmaster and 20 reels, with 140 Kodachrome illustrations in 3 dimension.

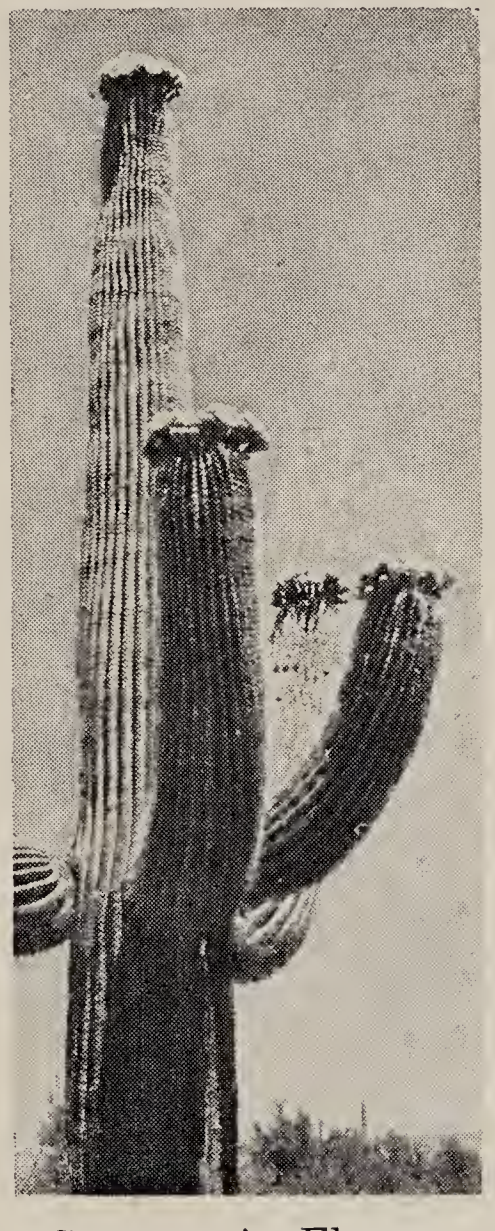
Cactaceae Marshall & Bock 8.20*

....*—postpaid.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

FEBRUARY, 1953



Saguaro in Flower

Proctor photo

REG MANNING

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Volume 7 FEBRUARY, 1953 No. II

Table of Contents

Editorial 15
Papago Park 15
Ask Mr. Cactus 16
Flowering of Desert Plants 17
Plant Names 21

Desert Botanical Garden of Arizona

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EDITORIAL

The Cactus Show plans are progressing nicely but we would like to be assured of more entries in all classes. We would be pleased to have more entries than our Auditorium will house, in which event we will provide a tent for the overflow.

We also need many more volunteers to assist us during the show both as watchers to prevent pilfering and as salesmen and saleswomen to sell Guided Tour pamphlets and to handle the Viewmaster Booth. If you can spare a day or a part of a day please contact Mr. Earle at WH 5-8513 and tell him when and how long you can help us out.

The Phoenix Camera Club is planning a bigger and better showing both of black and white and of kodachromes for exhibition during the show.

The Show will be sponsored by the Phoenix Gazette as in the past which assures perfect news coverage of all events.

ELECTIONS

In compliance with our by-laws, I have appointed the following members to act as a nominating committee to select candidates for the two vacancies caused by the expiration of the terms of the directors elected in 1949 for 4 years:-

Chas Meig — Chairman
John Hale
Carroll Mills

The Committee's selections will be on the ballot in the March Bulletin so that our members can return the ballots to us before the annual meeting on the third Sunday in April

W. Taylor Marshall, Pres.

ADVISORY COMMITTEE

The appointment of Mrs. Harold R. Holcomb to our Advisory Committee and her acceptance is announced. Both Mrs. Holcomb and Admiral H. R. Holcomb, U.S.N. Retired are deeply interested in the Garden as a civic project of great value to the people of Arizona.

In addition to Mrs. Holcomb the Advisory Committee now includes:-

Mrs. Alfred Alschuler — Tempe, Writer and Civic Leader.

James Cahill — Cahill Desert Products, Phoenix.

Fred Gibson — Director Boyce-Thompson Arboretum, Superior.

David E. Henes — Public Relations, Republic & Gazette, Phoenix.

Mel Hinman — El Rancho Motel, Phoenix.

Sam Jones — Radio Commentator.

W. Warren Krause — Publisher Arizona Guide, Phoenix.

Mrs. Homer Lininger — Lodge on the Desert, Tucson.

Mrs. Mildred May — Valley National Bank, Phoenix.

Mrs. Edith Mayrath — Phoenix.

Dr. James McCleary — Arizona State College, Tempe.

Eleanor B. Sloan — Arizona Museum, Tucson.

Jack Stewart — Camelback Inn, Phoenix.

PAPAGO PARK

The area included in Papago State Park in which the garden is located, was once Papago-Saguaro National Monument but was turned over to the state by the federal government when Saguaro National Monument was established near Tucson.

In the deed of grant the federal gov-

ernment clearly limits the usage of this territory to a recreational area. Therefore the Capital Building and a Governor's Mansion could not be built there unless by special Act of Congress.

The rapid growth of Phoenix has resulted in the use of lands suitable for recreation areas as housing developments and we deem it most important that Papago Park be reserved solely for recreational purposes in conformance with the intent of the federal government at the time the Park was given to the State.

A Fair Grounds could be interpreted as coming within the definition of "recreation" as could a Stadium for Arizona State College and a Zoo of native animals and the Botanical Garden.

The proposal of the Park Department of the City of Phoenix to make a golf course in the area and to increase picnic facilities and to reopen the existing picnic facilities under policing is certainly within the original concept and these should be encouraged.

The Capitol, on the other hand, defeats the purpose of "recreational area" and at any rate should be more centrally located than is possible eight miles from downtown Phoenix.

ASK MR. CACTUS

Jan. 17, 1953

Question: —

"My Dear Mr. Marshall —

While we were at Camelback Inn during November — we had the pleasure of hearing you speak and showing your beautiful pictures of the Flowers of the Desert.

On our way home, we drove via Tucson and were amazed at the thousands of saguaro cactus that covered so many acres of ground. But we were impressed with the seeming lack of small saguaros. We saw practically no baby ones and but a few 3′ to 5′ tall.

Our curiosity was aroused to the extent that we planned to write to you and ask if there was any reason for this, and upon seeing your name and quotations in January's "Holiday" Magazine feel quite sure you can explain.

We surmise there was a period of time where all Nature was in fine shape for this particular plant and they grew prolifically — then something evidently happened — what was it?

Wouldn't it just be a tragedy if there were no replacements of this most interesting plant?

I hope I have not asked for too much of a busy man's time for an answer to my questions and assure you it will be most appreciated. Pennsylvania."

Answer: — A saguaro cactus is a very slow growing plant and at one year is about the size of a large pea. If the seed germinates in the open it would be killed by the summer sun and heat.

Therefore only those seeds which germinate under trees or shrubs can survive that first summer.

Such seedlings slowly grow through the shrubs or tree to reach a height of 8 feet in about 100 years and are seen only by careful observers who look into the shrubbery for them.

Growing through trees, with branches rubbing off spines produces the scarred appearance of the base of many saguaros.

Propagation of saguaros was retarded in many areas, especially near cities, by cutting of mesquite and ironwood trees for firewood, a waste now prohibited by our plant protection laws and at this time the saguaro is safe from extinction except for the activities of the most destructive of all animals — man.

Information On

Flowering of Desert Plants

THE DESERT BOTANICAL GARDEN of ARIZONA In Papago Park

Mail address Box 547, Tempe

The center four pages can be removed to keep for future information.

FLOWERING OF DESERT PLANTS

One of the questions most frequently asked us requests information about the flowering periods of Cactus and other desert plants. The questions come from Magazines and Newspapers, Chambers of Commerce, and Automobile Clubs, photographers and cactophiles and come by mail, telephone and telegraph.

To answer them we have had a mimeographed sheet which fairly covered the question but we feel that so many of the answers would interest our general membership that we will attempt to give a more detailed account of them.

Wild flowers are dependent on plentiful spring rains and so will be found every year in the mountain districts but on the desert, spring rains are not usual and the rains that do occur are spotty, usually in the form of local cloud-bursts. Where these occur wild flowers are found in quantity. Last year such districts of flowers were noted near Picacho Peak, at Oracle Junction and near Wickenburg, with lesser showings at other points.

We try to keep posted on these flower islands and will be glad to give our information to anyone interested if you will call us.

Great fields of wild flowers throughout the desert have not been seen since 1941 when the heavy spring rains filled to overflowing Roosevelt Dam and the whole Salt River storage system. The pictures of wild flower carpets shown in many magazines were mostly taken at that time.

There is no time when "all of the species of cactus are in flower" because they have each their own flowering period which we schedule below. Also the flowering time of any species with a wide range is variable by altitude range of the plant. In the lower valleys the purple hedgehogs (Echinocereus Engelmannii and E. Fendleri) flower in April. At 5,000 feet the flowers do not open until May and on the North Rim of the Grand Canyon and other high altitudes they flower in June and July.

With the exception of the Barrels (Ferocactus sps.) and the pincushions (Mammillaris sps. and Coryphantha sps.), the chollas (Opuntia sub-genus cylindropuntia) and a few species of Echinocactus, the flowers of which are borne at the summit of the plant in rings, all other flowers are on the sides of the stems and such flowers appear only on the south side of the stem and are therefore frequently overlooked.

For example, if driving on an east-west road no flowers are observed if you look south but they are visible if you look north.

Even prickly pears (Opuntia sub-genus Platyopuntia) which bear most of their flowers on the margin of the plate-shaped stems, bear some flowers on the side of the stem which faces south but not on the side facing north.

The barrel cactuses (Ferocactus sps. and Echinocactus sps.) usually have the plane of the apex of the plants tilted to the south or southwest so that the flowers can best be seen when looking north.

The Saguaro (Carnegiea gigantea) bears flowers on the apex of the stem as well as down the sides of the stems but usually on the south side of the stem.

Day flowers open at 9 to 10 A.M. and close at 4 to 5 P.M. if the sun is shining, but they will close at once when a cloud obscures the sun and may take as much as an hour to reopen when again in sunshine.

Most cactus flowers open only one day or one night but the claret cup hedgehog (Echinocereus triglochidiatus and its varieties) opens in the morning

and remains open day and night for five to seven days.

The night flowers open shortly after dark if there is a cooling breeze but later on hot nights. Most of them close about 8 A.M. but the Saguaros will remain open until noon or later on cloudy days. Others, including the sweet potato cactus (Peniocerus Greggii) and the dahlia night cereus (Neoevansia Diguettii) close just before dawn and these are seldom seen except by real cactophiles who hunt them at night with a flashlight.

The greatest number of species are observed in flower at the same time in April and early May on the Arizona desert.

Schedules of certain species: —

Saguaro — Flowers in May, fruits in June. Flowers and fruit equally photogenic. Open after dark, close noon to 3 P.M.

Barrels —

California barrel (Ferocactus acanthodes) Flowers in April and August. Flowers throughout the summer.

Wislizeni's barrel (F. Wislizeni) Flowers in mid-summer with the most showy flowers of all the barrels in shades of red to yellow.

Coville's barrel (F. Covillei) Found in Arizona principally on the Papago Indian Reservation. Flowers July to September.

Many headed barrel (Echinocactus polycephalus) Flowers in mid-summer.

Hedgehogs —

Engelmann's (Echinocereus Engelmannii) April in low desert, May at higher altitudes.

Fendler's (E. Fendleri and varieties) April at low altitudes, progressively later at higher altitudes. June, July at 7000 feet.

Claret Cup. April or even late March in our garden but June to July in the mountains.

Prickly Pears — April on low deserts to June at high altitudes.

Chollas — About the same as prickly pears.

Yuccas — April to June according to altitude.

Century plants—(A gave sps.) April to June.

Ocotillo — (Fouquieria splendens) is not seasonable but will flower after any heavy rain, which accounts for the flowers being open in some district while the plants are barren in adjoining districts.

Pincushions —

Fish Hook (Mammillaris microcarpa) April and August.

Cream pincushion (M. Heyderi and varieties) April in our garden but May or June at higher altitudes.

In conclusion, let us say a word about photographing plants in the Desert Botanical Garden. At first we permitted anyone to use a camera at will but we found that many thoughtless photographers stepped into the beds to get a picture meanwhile trampling many young seedlings and frequently sticking the sharp point of their tripods into other plants which permitted entrance of infection, resulting in the loss of many valuable plants to us.

We also frequently had to remove spines from the stern portion of their anatomy after they had backed into a cholla.

For their own protection as well as the protection of our plants we have found it necessary to ban tripods while the public is in the garden and require all photographers to secure a free permit before taking pictures. The permit is granted to anyone who signs an agreement to remain on the paths and to refrain from the use of tripods.

For professional photographers or qualified amateurs we provide an escort on Mondays or any morning before the public is admitted, by pre-arrangement, and permit the use of tripods and step-

ping into beds under the supervision of one of our staff. For this service a small charge is made to members.

Phone or write for an appointment for this special privilege arrangement. Phone WHitney 5-8513.

Main Entrance Administration Building

This garden was assembled and is operated by The Arizona Cactus and Native Flora Society Inc, a non-profit, public service organization which is supported in part by an endowment from the late Gertrude Divine Webster but principally by memberships and donations.

Memberships are from $3.00 to $50.00 a year and include a subscription to SAGUAROLAND BULLETIN, a magazine devoted to spreading knowledge of desert plants and their use in garden planting, which is issued ten times a year. We invite you to become a member of the Garden for your own pleasure and to assist in the educational work of the Garden.

FOUNDER	$500.00
LIFE	100.00
Annual:	
BENEFACTOR	50.00

SUSTAINING	25.00
SPONSOR	10.00
BUILDER	5.00
ACTIVE	3.00

PLANT NAMES

The Desert Botanical Garden has gone on record many times as favoring the use of a very simple classification of plants especially of cactuses.

We have followed the classification of Drs. Britton and Rose as simplified by our director in his Cactaceae published in 1941 and further simplified in his publication in the French Cactus Journal.

The leading American Cactus Journal has, on the other hand, followed the complicated splitting of Backeberg and later of Buxbaum and ridiculed our directors comment that such splitting could only result in complete rejection of these modern works and a return to the classification of Schumann.

Backeberg based his splitting on his own infalible intuition and Buxbaum on his theory of genetics.

Before them others had assured us that all classification problems could be solved by the newly discovered chromosome count but it now appears that chromosome count will vary within a species where geographical distribution is broad and altitude range diversified.

It would be better to wait for proof of the workability of any theory before accepting changes in classification based on such theories.

An example of the reaction of the average plant lovers to this continuous change of names came to our attention in a news letter sent to his customers by Kenneth W. Harle of Lower Basildon, Berks, England.

We are taking the liberty of printing herewith a large portion of that news letter which we believe, reflects great credit to Mr. Harle:-

"On another page you will find a diatribe headed "A nurseryman's lament" which we wrote last autumn. By itself it would cut little ice and would be taken by most of our acquaintances from whence it came. But — aha! we have upport and backing. The delightful little skit by one of our good friends whom we have known since he was knee high to a Rebutia (Aylostera) points up the said diatribe in no uncertain manner. Then again, a reprint from an American magazine in the current number of the Royal Horticultural Society's Journal shows that similar troubles are to be found in kindred spheres. Are we therefore on the verge f a revolt of the Common Man? Shall we see in the near future these batchy botanists — these doglatin dictators, driven back to the place where they belong. Will it be possible to print a few thousand labels and know that, even if they are not used up inside three months, nevertheless, the name will still be valid? If so — hurrah for the (near) future.

Yours sincerely,

Kenneth W. Harle."

A NURSERYMAN'S LAMENT

Our annual difficulty is annually becoming more difficult. You see, our position is invidious. We are, as we hear on all sides, merely growers of succulent plants. By the erudite we are known as "'dealers" and thus kept firmly in our place "below stairs" as it were. It follows therefore that we are expected to keep up with any fashionable trend in nomenclature just as my tailor insists on three buttons on the sleeve this year whereas there were but two last time and in Bond Street last year's chic colour was Robin's egg pink whereas one is not presentable these days except in Rabbit's foot green.

Now, strange as it may seem, in the solitude of our little den and in our slippers so as to make no noise, we stamp our little feet and petulantly whisper, to —— with the experts. This

immediately makes us feel so much better.

In a certain work by two eminent gentlemen, one can find, on page 72, a short paragraph, which in 47 words, puts the matter in a nutshell. We quote:

> "There is a deplorable tendency to split the accepted genera for minor differences which, if carried to its natural conclusion, will create a confusion so great as to necessitate a return to the few, large genera of Schumann as more convenient than the innumerable, small, poorly differentiated genera."*

---

*Cactaceae — Marshall & Bock, 1941.

TO THIS AMEN

Now — shall we stick to the generally accepted classification and be regarded as out-of-date, or shall we go all out and be fashionable and incidentally make greater sales by pandering to the label collectors. It's a hard decision for we need the money to look after our overheads. After much travail we have decided to forego the extra new car this year BUT IT WAS A CLOSE THING MIND YOU.

IN ALL CEREUSNESS

By POLLY SEFFALUS

The question of acquiring new succulents is one that, I feel rarely receives the quota of study it deserves, and is often entirely ignored by youthful fanciers swept off their feet with enthusiasm and impatience. The whole subject demands protracted thought and a cool, unemotional approach. Let me illustrate this by describin gin diary form my own severely logical and scientific procedure in the selection and purchase of new plants.

March 20th — 8:30 a.m.

Aha! Here is Harcourt & Neilson's Bumper Catalogue by the morning post. I propose to keep my order — if I decide to order at all — down to 5/—, and to include only authenticated species known to be small enough or otherwise suited to my limited accommodation. Fancy names, like Escobaria Fortescue-Brethringtonii Gpkxz, ("choice treasure slow growing full sun 2" 4/6d") must be eschewed — or maybe perhaps I'll pass just that one — but only for the purpose of exposing nomenclatural fallacies.

8:35 a.m.

Hmmmmmm. Opuntia introdassia sounds new — might as well have it — and Aloe erupto, too — oh, and just for fun Epiphyllum x "Bleeding Passion" ("blushing rubies in emerald mantle new slowgrowing 6" 3/6d"). Mustn't overlook Hocus farinocus, either — scientific interest in unheard of genus, of course — and This Month's Special Bargain — and — Oh Golly! 17/6d. gone already!

Oh well, I've practically just given up smoking, so I might as well throw in a couple of Faucarias ("remarkable connoisseur species") and make the order up to £1 to get it post free.

8:40 a.m.

At the last minute Rebutia senilis is crossed out in favour of Pilocereus sp.?? Grabshekel No. 2717/KXG ("recent very rare seedling only 3/6d. difficult"). What's that? My tea's cold, egg only half finished and my train goes in 2½ minutes? Oh, who cares: I shall have to stop for the Postal Order on the way anyhow. . . .

8:50 a.m

Order in post. Was I wise to have included that Escobaria after all? It's sure to be a problem child. Should have plumped for the good old Crassula falcata instead . . . to late too change now, though.

March 21st — 8:30 a.m

Harcourt must be reading my letter now — or is it Neilson who attends to the orders? If he's sold out of that Escobaria I shall shoot myself . . . if only I could have caught an earlier post.

March 22nd

If they sent off my plants yesterday evening I might get them today! Funny how slowly the time seems to pass.

March 23rd

No order yet. Missed my train waiting in to catch the morning delivery. Wish I'd included Euphorbia Caput-Nebuchadnezzarii ("great snakes dry in winter") instead of one of the dull well-known items. Still 7/6d. seems a lot for one plant. . . . I wonder: did I remember to seal down the envelope?

March 24th

Four whole days — nearly a hundred hours of agony — and no sign of a reply yet. The Post Office must be to blame: they've sent my letter to Honolulu instead of Hounslow.

March 25th

The morning papers report a crime wave from a gang of racketeers believed to be masquerading as respectable florists. They mention no names, but I guess Messrs. H. & N. are by now enjoying a Mediterranean cruise on the strength of my misguided Postal Order. I hope they are horribly seasick. . . .

March 26th

A letter from them at last! This will be my P. O. returned as "All items are sold out." Or, maybe, a request for alternatives (I could kick myself for not having named any). Perhaps they're so stricken with remorse at keeping me waiting they're warning me to expect a triple-sized delivery. Or even: ". . . in view of your outstanding discernment in selecting species, we wonder if a business partnership would interest you...."

Actually it was just a receipt for my order, bisected in my efforts to open the envelope from the wrong side with the butter-knife.

March 28th

Weighed myself during the lunch hour. I've lost ten pounds with worry in the past fortnight.

March 29th

My worst fears must surely be true. Some imbecile, underling office boy at the firm has misread my address and sent the parcel to Siberia. Couldn't sleep a wink all day at work.

March 30th — 5:40 p.m.

Walking sadly homeward, my thoughts idly revert to the Parcel That Never Comes. I mentally land a straight left to Harcourt's (or is it Neilsen's) jaw and quicken pace to avoid a policeman who was eyeing me rather strangely.

How lovingly I should have unfolded the parcel wrappings: how gently withdrawn the specimens and systematically laid each, with label, alongside its prepared and ready-crocked pot.

I'm so busy affirming the merits of the slow, methodical approach, I scarcely notice the big package standing in the hall. I'm halfway up the stairs when it flashes on me what it is. . . .

6:00 p.m

The last specimen has just been potted and (against every order) sprayed to wash off the adherent soil which now covers everything — floor, chairs, tables and furniture. Funny that I never thought to prepare any compost, but it was lucky I still had that bit of bulb fibre left, and anyway I can always make a better job of them tomorrow when there's more spare time. Yes, there's always tomorrow. . . .

I had a bad moment when a Faucaria vanished under the piano, and another when Escobaria Fortescue - Brethringtonii (the image of E. tuberculosa) was missed and turned up only after frantic searching in the ash-bin amongst the box and wrappings.

Opuntia introdassia turned out to be another O. microdasys, but at any rate I can always put it in that hideous yellow china vase as a Christmas present for Aunt Edith, who raves over anything alive, pats it fondly and says: "Oh, but how ducky!" . . . The mystery Hocus doesn't seem to be a Succulent at all. It looks a bit like — by Jove, yes, it IS! — Hoya carnosa! Funny how these

names get altered — like the "Aloe erupto" — Aloe eru, P.T.O., last line on page 3! Still, I hadn't one before, even though it does look precariously like another over-watered Aloe arborescens....

This Month's Special Bargain was an unidentified Echinopsis ("not bloomed yet but reputed to be blue 2/6d.") which unfortunately got mixed up with my other eight so I must wait for its reputedly blue blooms before I know which it is again.

Agave "Grandmother's Hatpin" looks superb, though I was silly to overlook the fact that it was almost certainly only another name for A. americana. It is.

11:00 p.m.

And so to bed, exhausted but triumphant. I'm still a bit worried about that tiny Stapelia — was it the right way up? And I'm sure that Faucaria arrived dead. . . . Or maybe it was just sunburnt. . . .

12:00 p.m.

In the first sound slumber for eight days, I visit Africa with Mr. Neilson (or is it Harcourt?) on the greatest label-collecting expedition of all time. We find them growing in square paper tubs labelled: "Handle with care full sun 75/—". The last one we dug up weighed half a ton and contained 115 syllables....

Desert Botanical Garden

Book Dept. **P. O. Box 647** **Tempe, Ariz.**

PACKAGED CACTUS PLANTS

Attractive packages with cut cellophane packing.

		Price	Postage*
No. 1	5 year old Saguaro Seedling 2" high	.50	.10
No. 5	5 plants	1.00	.30
No. 10	10 plants	1.50	.40
No. 10W	10 white spined plants, collectors items	3.00	.40
No. 15	15 larger plants	2.50	.50
No. 16	16 still larger plants	4.50	.60
No. 24	24 large plants many of flowering size	7.00	1.00

BOOK SUGGESTIONS:—

	Price	Postage*
Arizona's Cactuses; Marshall paper binding	1.00	.15
cloth binding	2.00	.20
A description of all of the species native to Arizona. 60 ills.		
Flowers of the Southwestern Desert—Dodge	1.00	.15
Flowers of the Southwestern Mesas—Patraw	1.00	.15
Flowers of the Southwestern Mountains—Arnberger	1.00	.15
Poems of the Desert by Lou Ella Archer. Cloth bound, beautifully illustrated in color		
Canyon Shadows	2.00	.10
Sonnets to the Southwest	2.00	.10

Gift Suggestions

	Price	Postage
Prickly Pear Delight— A Turkish delight type of confection made from prickly pear cactus fruits, provocative flavor		
½ pound box	.80	.20
1 pound box	1.50	.30
Prickly Pear Jelly— 4-12 oz glasses in shipping carton. A clear red jelly of exceptional flavor	2.20	.80

* Postage and wrapping charges.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

MARCH, 1953

Opuntia laevis

REG-MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Arizona Cactus and Native Flora Society

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Vice President .....Lou Ella Archer
Treasurer .....Tom Goodnight
Secretary .....Angela Bool
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Board Members

Edward L. Burrall
Leslie J. Mahoney
Marguerite Rockwell
Reg Manning
John H. Rhuart

Volume 7 MARCH, 1953 No. 3

Table of Contents

Editorial 27
Cactus Show 27
Desert Botanical Garden 29
Echinomastus Acunensis 33
Opuntia Whipplei 35

Desert Botanical Garden of Arizona

Staff

Director .....W. Taylor Marshall
Superintendent .....W. Hubert Earle
Curator of Herbarium .....E. R. (Jim) Blakley

Garden hours: October to April inclusive, open 10 A.M. to 5 P.M. daily and Sunday. Closed every Monday. Lectures on Sunday at 3:30 P.M.

EDITORIAL

Election:- With this Bulletin we are enclosing postcard ballots with the choice of our nominating committee for the two vacancies caused by the expiration of the terms of two of our directors. You may vote for the committee's choice or you may write in your own nominations.

Our board is comprised of eleven members whose terms expire as follows:

1956—Reg Manning, Les J. Mahoney, W. Taylor Marshall, President.

1955—Mrs. Lou Ella Archer, Vice President; Mrs. Angela Bool, Secretary; Wm. Eliot.

1954—Mrs. Marguerite Rockwell, John H. Eversole, Chairman; Tom Goodnight, Treasurer.

1953—J. H. Rhuart, Edward Burrall.

You will note that our committee proposes that Mr. Rhuart and Mr. Burrall should succeed themselves because both men have proven very valuable board members.

Ballots must be received by us on or before April 15th to be counted at the annual meeting of the Society which will be held in our Auditorium on Sunday afternoon, April 19th at 3:30 p.m.

We hope that all of the members living in Arizona will attend that meeting at which complete reports on the progress of the garden and of the future plans will be presented.

CACTUS SHOW

Our sixth annual Cactus Show under the sponsorship of the Phoenix Gazette was a tremendous success in every way.

The wonderful publicity given to it by the Gazette assured crowds larger than for the preceding shows and the Cactomaniacs united in entering better and more exhibits than ever before.

The Phoenix Camera Club had somewhat fewer but certainly better kodachromes and black and white pictures this year and the showing reflected great credit on Miss Blanche Adams, chairman for the Camera Club and a valued member of our organization.

Our members were most generous with their valuable time and the following volunteered for the periods noted:- Chas. Mieg, 3 days; John Hales, 3 days; L. H. Knaak, 2 days; Wm. Rand, 3 days; Sandy Wise, 1 day; Carroll Mills, 2 days; C. C. Pidgeon, 2 days; Mr. and Mrs. Fred Parrott, 1 day; Mrs. Elva Covert, 2 days; Mrs. C. D. Oskins, 2 days; Mrs. Richard Williams, 1 day; Mrs. Sylvia Hermann, 1 day; Mrs. H. R. Holcomb, 1 day.

Mr. Geo. Purdy was on hand during the entire show and our very special thanks to him. Mr. and Mrs. Joseph Birchett, who gave us three full days of their time, also deserve our special and sincere thanks.

Judge for the show was Howard E. Gates of Gates Famous Cactus Gardens, Corona, Calif. In addition to judging the show, Mr. Gates donated five of the prizes and helped as a guide from Sunday till Thursday.

Two other prizes were donated by Cahill Desert Products Co., makers of Prickly Pear Jelly and Delight.

Sandyland Cactus Nursery, Herb and Angela Bool, donated three special packs of rare cactus plants one of which was given as a prize and the other two sold for the benefit of our garden.

Nine prizes were planned and they were to be awarded to the entrants who scored highest points in the sweepstakes competition. There were two ties in the scoring, so eleven prizes were awarded as follows:

1. Chas Mieg
2. Mrs. Elva Covert

(Continued on Next Page)

3. Mrs. R. I. Turner
4. Mrs. Richard Williams
5. Mrs. Barbara Smith
5. Mrs. Joseph Birchett
6. Louis Knaak
7. John Hales
8. Wm. Rand
9. Wm. Jamison
9. Mrs. C. D. Oskins

GARDEN HISTORY

We constantly receive inquiries from scientific societies and from individuals for the complete story of the origin, progress and services of the Desert Botanical Garden and no material is available covering this information.

We will therefore give all of these facts in a four page article in this issue of the Bulletin in such a form that it can be removed and preserved for future references.

The four center pages of this Bulletin can be removed for this purpose.

CORRECTION

In our February Bulletin insert on page 20 an error in printing resulted in the statement that a small charge was made to members for Monday photography with tripods.

It was our intention to state that a small charge for a man's time for supervision of photography with tripods on Monday (the only day tripods are allowed) was made to non-members.

Members are not charged for this service.

Juvenile forms of Barrel Cactuses. Left, Ferocactus Covilei; upper right F. wislizenii; lower right F. acanthodes

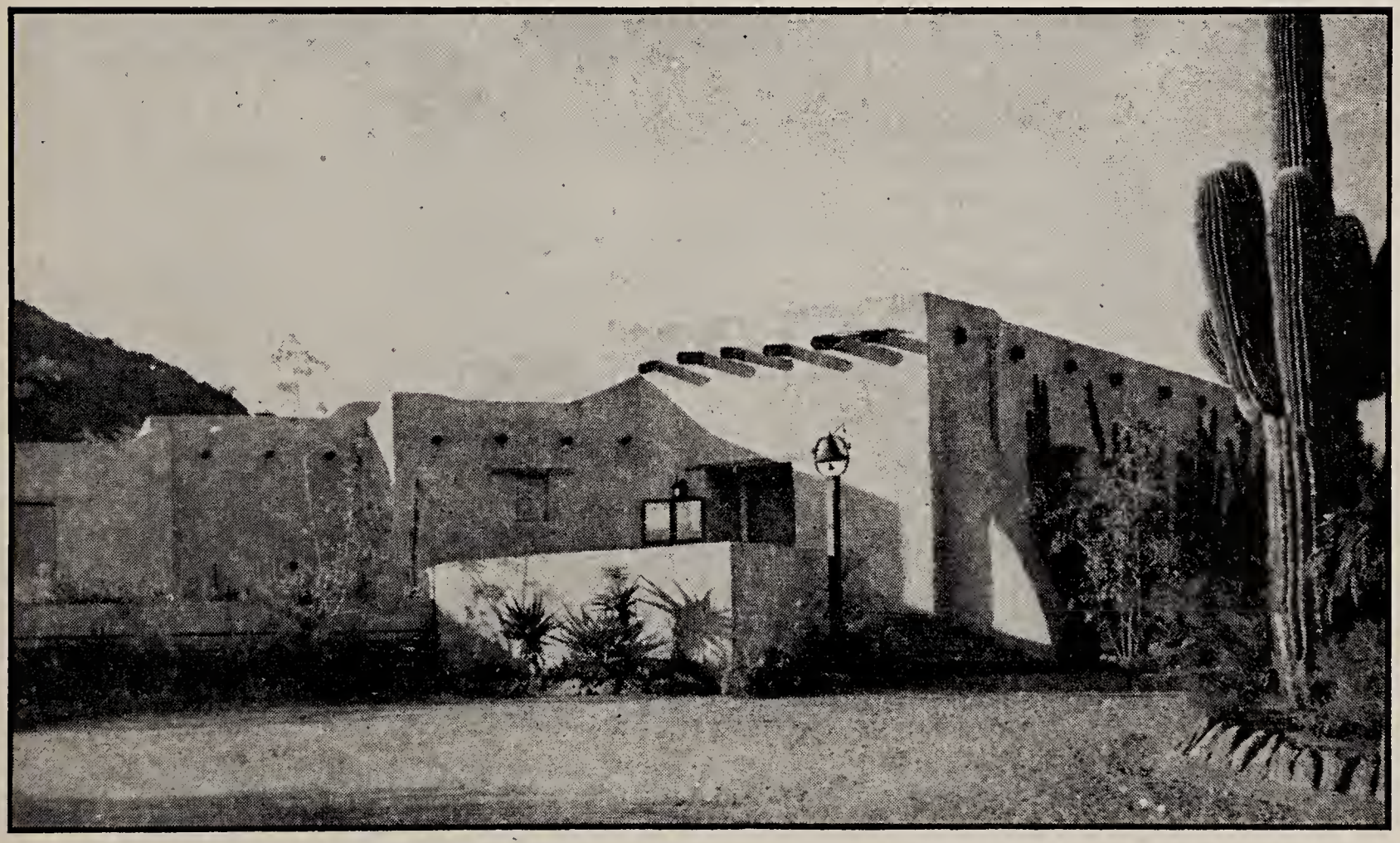
Information On

THE DESERT BOTANICAL GARDEN

of ARIZONA

In Papago Park

Mail address Box 547, Tempe



Main Entrance Administration Building

THE DESERT BOTANICAL GARDEN OF ARIZONA

The Garden was first envisioned by the late Gustaf Starck of Scottsdale whose botanical mind realized the possibilities of growing desert plants of all the world's deserts in the favorable Arizona climate for study in one location.

His was the idea but it was not until Mrs. Gertrude Webster became interested in the project that any progress was made toward realizing the dream. Mrs. Webster had the needed money and the influential connections and she largely financed the beginning of the project.

The Arizona Cactus and Native Flora Society was formed to sponsor a Botanical Garden and after Mrs. Webster joined it she brought about its incorporation as a non profit, educational body in 1937.

Mrs. Webster interested many prominent Phoenicians in the Garden and in 1938 planting was started and plans for an Administration building were drawn. In 1939 the building was erected and on Jan. 21st, 1940, the completed building was dedicated.

George Lindsay was appointed as the first Director of the Garden in 1938 and he directed the first planting on the grounds and the landscaping of the area around the Administration building.

When Mr. Lindsay went into the Army he was succeeded by Chas. B. Fleming in 1940. Mr. Fleming originated study groups in the garden and remained until the garden had to be closed to the public in 1941 to remain closed during the war.

From 1941 to 1946 the garden was in the hands of a series of caretakers and much of the planting was lost due to lack of proper supervision.

In December 1946, W. Taylor Marshall became the Director of the Garden and early in 1947 he became President of the Arizona Cactus and Native Flora Society.

April 1st, 1947, Mrs. Webster died and bequeathed to the Garden her Arizona estate to be held in trust by the Valley National Bank. This trust fund now produces about $9,000 annually and provides for nearly one-half of the cost of operating the garden. The additional $10,000 annually is provided by memberships, contributions and proceeds from a book department at the garden.

Our present director has greatly increased the plantings by moving his large personal collection to the garden and by donations from others and collections made by the garden staff.

An all metal lath house of 5,000 square feet was erected in 1950, a beautiful building for rest rooms in 1951 and a residence for the superintendent in 1952.

Early in 1947 W. Hubert Earle joined the garden staff first as horticulturist then chief horticulturist and he is today our Superintendent.

In 1950, E. R. Blakley, a botany student at Arizona State College, Tempe, joined the staff for part time and summer work and to him was assigned the task of assembling an herbarium. After his graduation Mr. Blakley became our full time Curator of Herbarium.

ACTIVITIES

About 120,000 visitors view the gardens each year. The garden is open to the public Oct. 1st to May 1st daily except Mondays from 10 to 5 p.m. In May, June and September we open only on Saturday and Sunday from 12 to 6 p.m. and we are closed during July and August. No admission is charged.

Lectures on desert subjects are given every Sunday from November to March. One lecture at 3:30 p.m. in November, December and March but two lectures are given at 3 p.m. and 4 p.m. in Janu-

ary and February and such Sundays in March that are cool enough to permit closing the building without discomfort.

Three series of five lectures each are given each season on Thursday afternoons at 3:30 p.m. comprising a course in "Appreciation of Desert Plants." No charge is made for any lectures as outlined.

Classes for advanced students in Taxonomy of desert plants is given each Monday evening at 8 p.m. No charge.

Public and private schools may bring classes to the garden any morning during the season, October 1st to May 1st by making an advance appointment. Classes must have enough adult guidance so that they can be broken into units of not more than 15 under each leader.

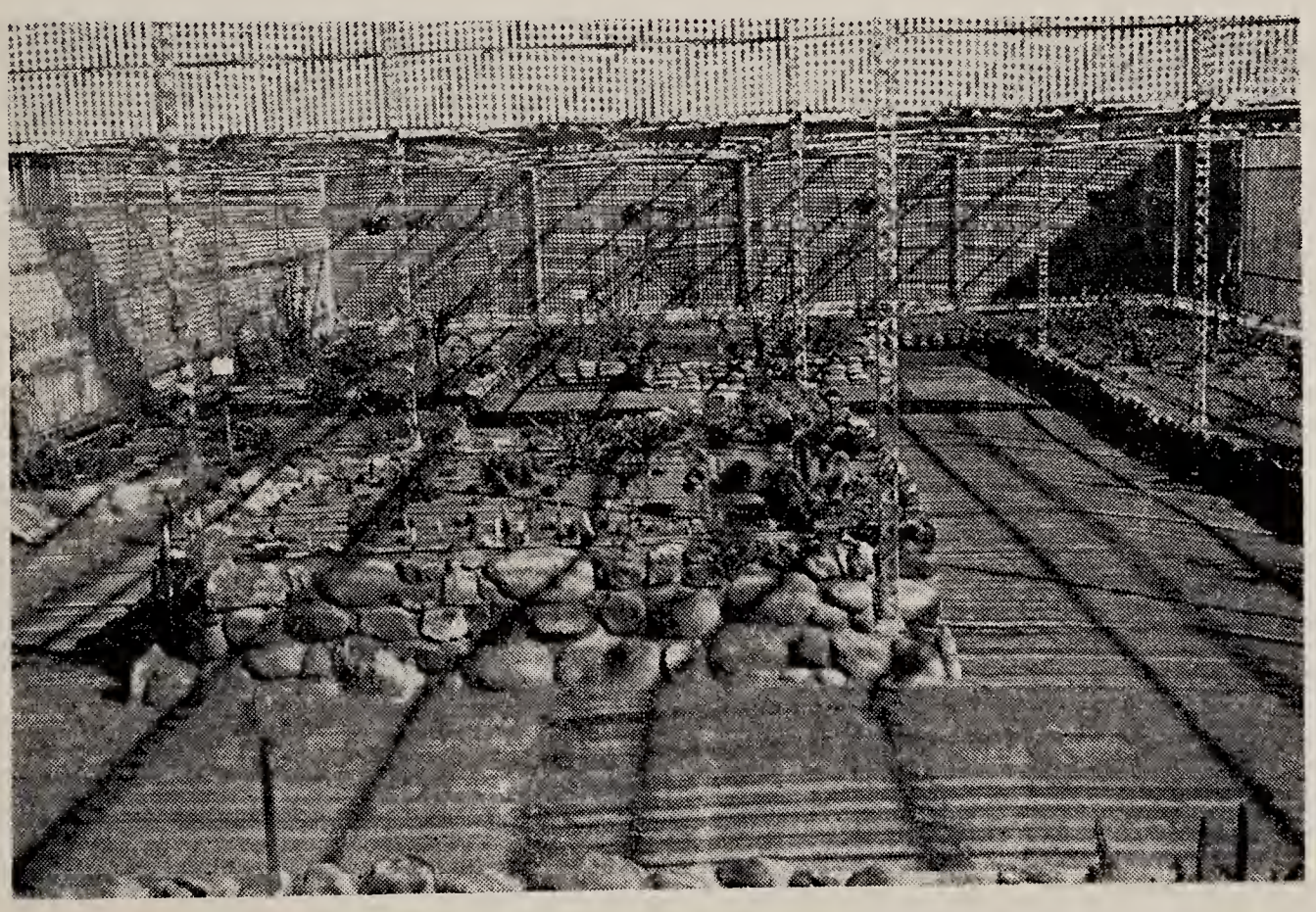
A Cactus Show is held annually for 8 days beginning the Sunday before Washington's birthday and closing the following Sunday. Exhibits of desert plants of all types and artistic arrangements of desert plants entered by amateur gardeners and collectors are shown during this period and our usual attendance during the show is 20,000 visitors.

Many thousands of species of desert plants are included in the present 20 acres under intensive cultivation and about 60 of the more interesting plants or groups of plants are described in our "Self Conducted Nature Walk" which can be purchased for 10c on the grounds.

Cactus and other succulent plants as well as trees, shrubs and annuals from the deserts of both North and South America live in harmony with succulent plants, trees, shrubs and annuals from the Karo, Kahahari, Sahara and Gobi and other deserts of Asia, Africa and Australia.

The beds are so arranged as to permit pictures to be taken from the paths of most of the species as they flower but photographers are required to sign an agreement to remain on the paths and refrain from the use of a tripod before a camera permit will be issued to them. There is no charge for a permit.

Commercial photographers and seri-



Interior view of lath house Desert Botanical Garden of Arizona

ous amateurs may arrange to use tripods on Mondays under supervision but a small charge is made to non-members for this privilege to cover cost of an attendant's time.

An herbarium is being assembled and can be consulted by botanists and students by appointment. We now have something over 5,000 herbarium sheets and many more unmounted specimens awaiting herbarium cases. These will be purchased as funds become available.

PLANS FOR THE FUTURE

In late 1953 or in 1954 McDowell Road will be opened along the north fence of our garden at which time our principle entrance will be from the new extension of McDowell.

We plan to change the entrance to our grounds to the nearest point to McDowell which is the point of ground where our lath house is located. Here much larger and more level parking lots can be developed and we hope to build at that new entrance a building to house the family of one of our staff members and also the book store and to make the entrance to the grounds through that store.

Still later we hope to erect another and larger lath house on the present parking lot to house a very complete collection of Asiatic and African species of succulent Euphorbias, the cactus-like spurges from those continents.

We also plan a summer school for botany majors from colleges outside the state to give the students first hand contact with all of the desert vegetation under natural conditions, an ideal impossible for most colleges where desert plants must be grown in hot houses.

Even now we are prepared to receive a few students for summer work in our garden during June to September 15th. Arrangements can be made for reasonable accommodations for such students and our collections and very extensive library will be available to them. Write for details.

SUPPORT

While the endowment from the Webster estate is sufficient to carry part of the cost of the garden we are required by the conditions of the grant to maintain a membership in excess of 200 in order to continue to receive that income.

We therefore invite all civic minded Arizonians and interested persons outside o fthe State to join us in membership and thereby assist even slightly in the financing of the garden.

Our Saguaroland Bulletin, issued 10 times a year, keeps members in touch with Garden activities and gives interesting reports on desert plants. It is sent to all of our members from the $3.00 a year active members to the other classes of membership at $5, $10, $25 and $50.

FOUNDER	$500.00
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SPONSOR	10.00
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ACTIVE	3.00

Echinomastus acunensis op. nov.

Wm. Supernaugh photo

By W. TAYLOR MARSHALL

Juvenile plant disc-shaped, to 1¼ inch in diameter; tap root fusiform; plant tuberculate, the tubercles bearing areoles on their apex from which 12 pectinate spines arise; spines dirty white with maroon tips, all radial but the uppermost one or two elongated and in center of plant connivent; central spines appear when the plant is about 1⅜ inches in diameter; mature plants up to 7 inches high, 4 inches in diameter, the tubercles now confluent to form about 18 ribs; tubercles flattened laterally, graygreen, bearing areoles on their apex, the areoles at first white wooly, naked in age; a groove extends from the areole to the base of the tubercle and the flowers are borne at the base of this groove; radial

spines 12, diversely spreading, not pectinate, heavy acicular, white with the upper ⅓ reddish-brown; central spines 3 or 4, the upper ones ascending and connivent, about 1 inch long, heavy acicular, reddish brown with lower ⅓ white; flowers large for genus, 2 inches or more long and broad when fully expanded, coral pink to mallow in color according to color chart in Webster New Int. Dict. 2nd Ed. unabridged; perianth segments oblong, obtuse, somewhat wavy on margins. Fruit 15mm. long, pale green, bearing papery scales and dehiscing by splitting; seeds black, rugose.

Type locality: Acuna Valley, Organ Pipe Cactus National Monument, Arizona.

Distribution: Hills of eastern Organ Pipe Cactus National Monument and around Ajo, Arizona.

Cotypes deposited in the Herbaria of The Desert Botanical Garden and of Organ Pipe Cactus National Monument.

This plant superficially resembles **Echinomastus erectocentrus** but has fewer and heavier spines and larger flowers which are very different in color. It was first discovered by Superintendent Supernaugh in the Organ Pipe Cactus National Monument on rocky hillsides. **E. erectocentrus** is always a plant of the valleys. The new plant is widely separated geographically from the known range of **E. erectocentrus.**

All plants located thus far are in the Acuna Valley of Organ Pipe Cactus Nat'l Monument and on the hills around the mine pit at Ajo. All plants have been located on small rocky hills at about 1700 to 1900 feet elevation.

Tallest plant found is 12 inches (it was dying apparently from maturity). One of the earliest cactus of the season to flower satrting in early April.

This plant was partially described in the first edition of Arizona's Cactuses under No. 2909:

Herba adolescens disco-formis, usque ad 6 mm de linea media, radix principalis fusiformis; herba tuberculata; tubercula areolas ferentia in apice sua, de quibus duodecem spinae pectinatae oriuntur; spinae sordide-blancae, cum cacuminibus baduis; spinae centrales apparent, cum herba 34 mm de linea media sit; herbae maturae usque ad 17½ cm altae, 10 cm de linea media; tubercula nunc confluentes, circa 18 costas formantes; tubercula lateraliter compressa, de colore griseo-viridi, in apice sua areolas ferentes, quarum areolae in statu puerili blancae laneatae, dum nudae in statu senili; canaliculus extendit de areolis ad basem tuberculi et in basi huius canaliculi flores feruntur; spinae radiales duodecem diverse extendentes, non pectinatae, valde aciculares, blancae, quarum tertia suprema pars rubida; spinae centrales tres aut quatuor, quarum supremae ascendentes and conniventes, circa 25 mm longae, valde aciculares, rubidae, quarum pars tertia inferior blanca; flores magnigenere considerato-, 25 mm et plus longi latique, maxima cum expansione, de colore puniceo aut hoc malvarum; segmenta perianthi oblonga, obtusa; parvi momenti undulatae in marginibus.

COVER ILLUSTRATION

Opuntia laevis Coulter. A species from southern Arizona and northern Sonora which has some value as a grazing plant for cattle because of the relatively few spines.

It ranges from Graham County through Cochise, Santa Cruz and Pima Counties but is nowhere plentiful, possibly because it is eaten by cattle.

A form from the Santa Rita Mountains of Santa Cruz County has many more spines and may possibly be a hybrid with Opuntia engelmannii.

In cultivation the plant grows more upright than does the same plant in the wild.

Opuntia Whipplei Eng. & Big.

R. C. Proctor photo

Desert Botanical Garden

Book Dept. P. O. Box 647 Tempe, Ariz.

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SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

APRIL, 1953

Chilopsis linearis (Cav) Sweet
Desert Willow
Photo by George Olin

REG MANNING

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W. TAYLOR MARSHALL, Editor

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Volume 7 APRIL, 1953 No. 4

Table of Contents

Editorial 39
Accessions 39
Wild Flowers 39
It Is True 40
Growing Cactus Seedlings 45
Cover Photo 46

Desert Botanical Garden of Arizona

Staff

Director .....W. Taylor Marshall
Superintendent .....W. Hubert Earle
Curator of Herbarium .....E. R. (Jim) Blakley

Garden hours: October to April inclusive, open 10 A.M. to 5 P.M. daily and Sunday. Closed every Monday. No lectures during April.

EDITORIAL

The Annual meeting of the Arizona Cactus and Native Flora Society which sponsors the Desert Botanical Garden of Arizona will be held in our Auditorium on Sunday afternoon, April 19th at 3:30 P.M.

We hope all of our Phoenix members will attend the meeting to hear our report for the last year and our future plans for the garden.

This issue of Saguaroland Bulletin has been written by W. H. Earle as guest editor. We hope you will find it interesting and informative.

ACCESSIONS

We have received during the past month plants from the following persons:-

Herman Schroeder, Avalon, Calif.—3 succulents.

John Daily, Del Rio, Tex.—3 euphorbias.

Charles Mieg, Scottsdale, Ariz. — 2 care cactus and one desert shrub.

Mr. and Mrs. E. R. Blakley, Phoenix—50 plants collected in Sonora and Sinaloa, Mex.

John Weber, Phoenix — 12 fig-marigolds.

Wm. Supernaugh, Organ Pipe Cactus Nat. Mon.—3 Opuntia sps.

WHERE ARE THE WILD FLOWERS?

Why isn't the desert in bloom? When are the wild flowers going to come out? Are we too late to see masses of flowers? These questions and countless others are asked of us many times a day till the few hairs left on our head are turning very gray.

To have the desert carpeted in bloom conditions must be ideal in that there has to be a period of long moisture and moderate weather from January to April.

This season started out fine with a good amount of moisture at the first of the year with proper heat and the wildflower seeds began to germinate in countless number. But a dry period set in which dried out the plants. This was then followed by a cold wave. The combination of these forces killed many plants and those that survived were stunted, thus only a few plants blossomed.

At the present time we can find in blossom along our highways and at the foot of the mountains the following plants — Desert Mallow (Sphaeralcea ambigua), Desert Marigold (Baileya multiradiata), Lupine (Lupinus sparsiflorus), Brittle Bush (Encelia farinosa), Hummingbird bush (Beloperone californica), Sand verbenea (Abronia villosa) and Ocotillo (Fouquieria splendens). These will continue to bloom for several more weeks and as they finish off in the desert you may find them and other flowering plants at higher altitudes in the mountains.

It would be fine to have stands of wildflowers as we did in 1929, 1942 and a fair showing in 1952 but it seems as tho these flowering periods are ten to twelve years apart. Many times we find "islands" of flowers in the desert and that is due to a heavy rainfall and proper conditions in that isolated area.

The Palo Verde trees, Acacias, Ironwoods and Mesquites will begin to bloom the latter part of April into late May and they are very attractive in colors from yellow to purple.

As usual the cactus can be depended upon regardless of rain, cold or heat to put on a showing. The hedgehogs have been blooming for several weeks in our valley and now showing color in the mountain areas. Beaver-tail and other prickly pears are now blooming along with the small attractive pincushions. The saguaros will start the last of April and continue to the middle of June. Please remember that the Saguaro blooms at night and they appear very fresh the following morning before the hot sun causes them to close.

We now have a greater number of cactus plants blooming in the garden than at any other time. Come out and see them before the days get too hot.

IS IT TRUE THAT:—

The Century plant lives to be a hundred years old?

No! The Century plant (Agave) lives from five to twenty-eight years depending upon the species.

This interesting plant was discovered by the early Spanish explorers in the West Indies and was taken back to Europe for study. The plants being away from their native habitat grew slowly in pots and took about 70 years to bloom. The Europeans figured the plants when first received in Europe must have been about 30 years old. So in adding 70 and 30 they arrived at 100 years or a "century" so that name has attached itself to the Agaves for the last 300 years.

The Agave is in the Amaryllis family and monocarpic in that it flowers and fruits but once in its lifetime. One then wonders how the Agave family can continue to survive over the years but it has three ways in which it continues propagation:

First—About a year before blossoming, the Agave will send out offsets around its base.

Second—Seeds are formed in the capsules of the flowering stock and are scattered by the wind when the capsules split partially open.

Third—Small bulbils or bulblets are formed in the flowerstock and persist until they are about 2-4 inches tall, have 4-6 leaves then detach themselves and fall to the ground and where they lodge and send out roots to establish a new plant.

The leaves of the Agave form a low basal rosette, are usually needle-pointed and usually have teeth along the edge of the leaf.

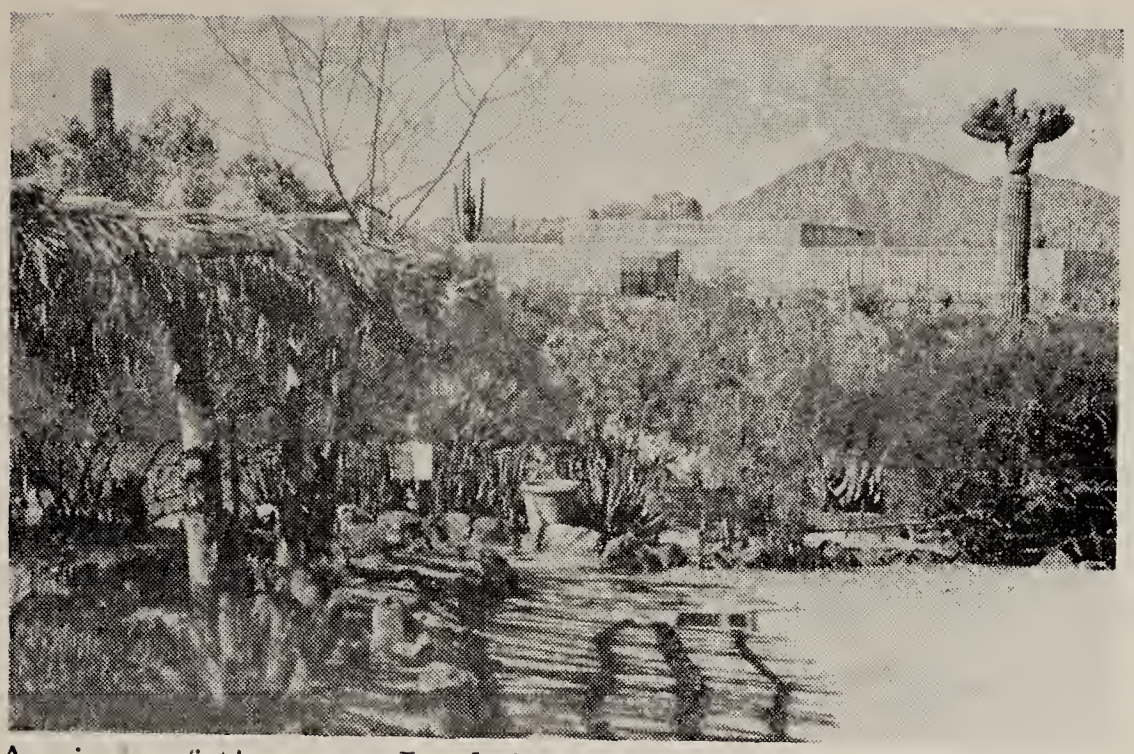
When the plant has a sufficient number of turgid or succulent leaves, the juices and energy begins to drain from these leaves to push up a large woody asparagus-like flowering stock from the center of the plant. This flowering stock may grow from 4 to 35 feet depending on the species. In our garden we have measured the rate of growth of the larger Agaves and a foot of growth a day is not unusual. Some of the stalks have grown 35 feet in 28 days. As the plant blossoms the plant is dying, so when the inflorescene is complete the plant is about dead though the flowering stocks and plant may remain in a dried out stage for many years.

The blossoms of the Agave range from white to a very striking orange and attract much attention when you see them as you drive along the highways in the mountains.

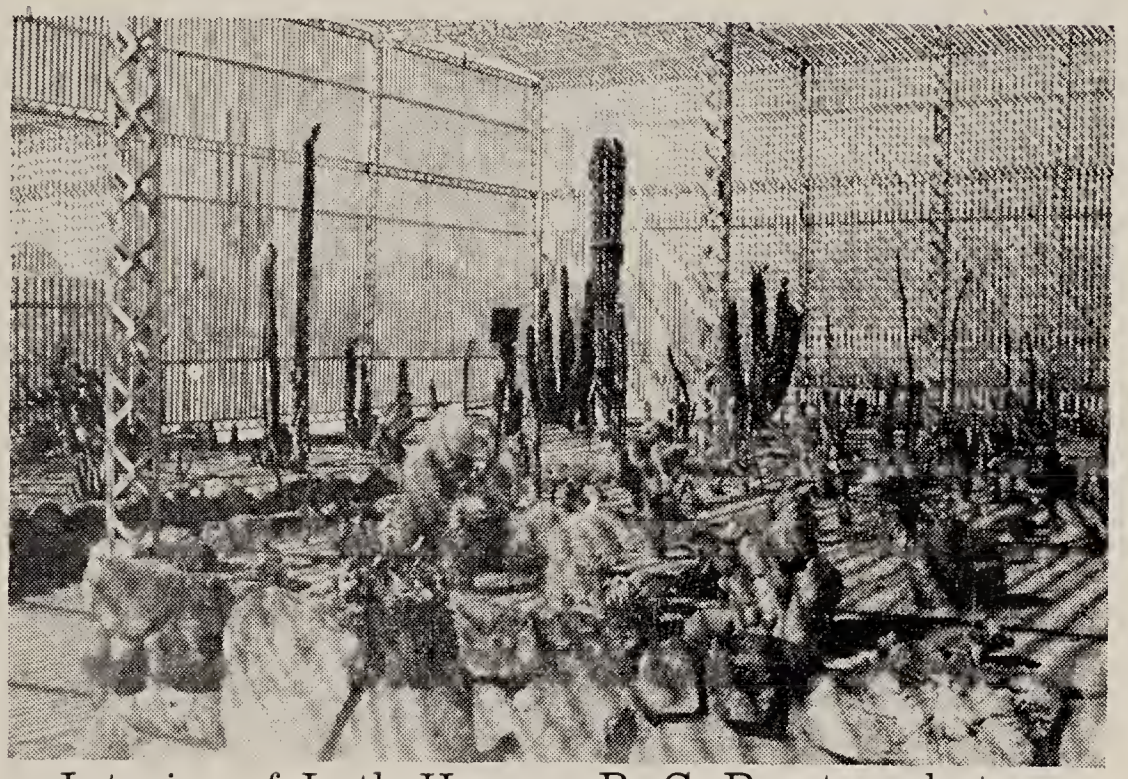
The Agave is cultivated in Mexico for the fibers which are used in the making of rope or string. The plant is sometimes called "mescal" for it also yields very intoxicating drinks called mescal, pulque and tequila; depending on how the juice is distilled or fermented. The Indians used the term "mescal" for the roasted caudex and emerging flower stock which they used for food.

The Agave is put to many uses but it does not live to be a hundred years—it just seems that long.

The following four pages of pictures may be removed and inserted inside the four page insertion included in the March issue to make an information folder on the Garden.



A view of the new Lath House from the parking lots. Camelback Mountain in background.



Interior of Lath House. R. C. Proctor photos.

Visitors inspect the plants.

Species of Star Cactuses.

The purple prickly pear. R. C. Proctor photo.
Opuntia santa-rita

Planting on North Side of Building.
Photo by Homer Rush.

A section of the Desert Botanical Garden.

Entrance to Director's residence.

The Superintendent's residence as it looks from the garden path.

GROWING OF CACTUS SEEDLINGS

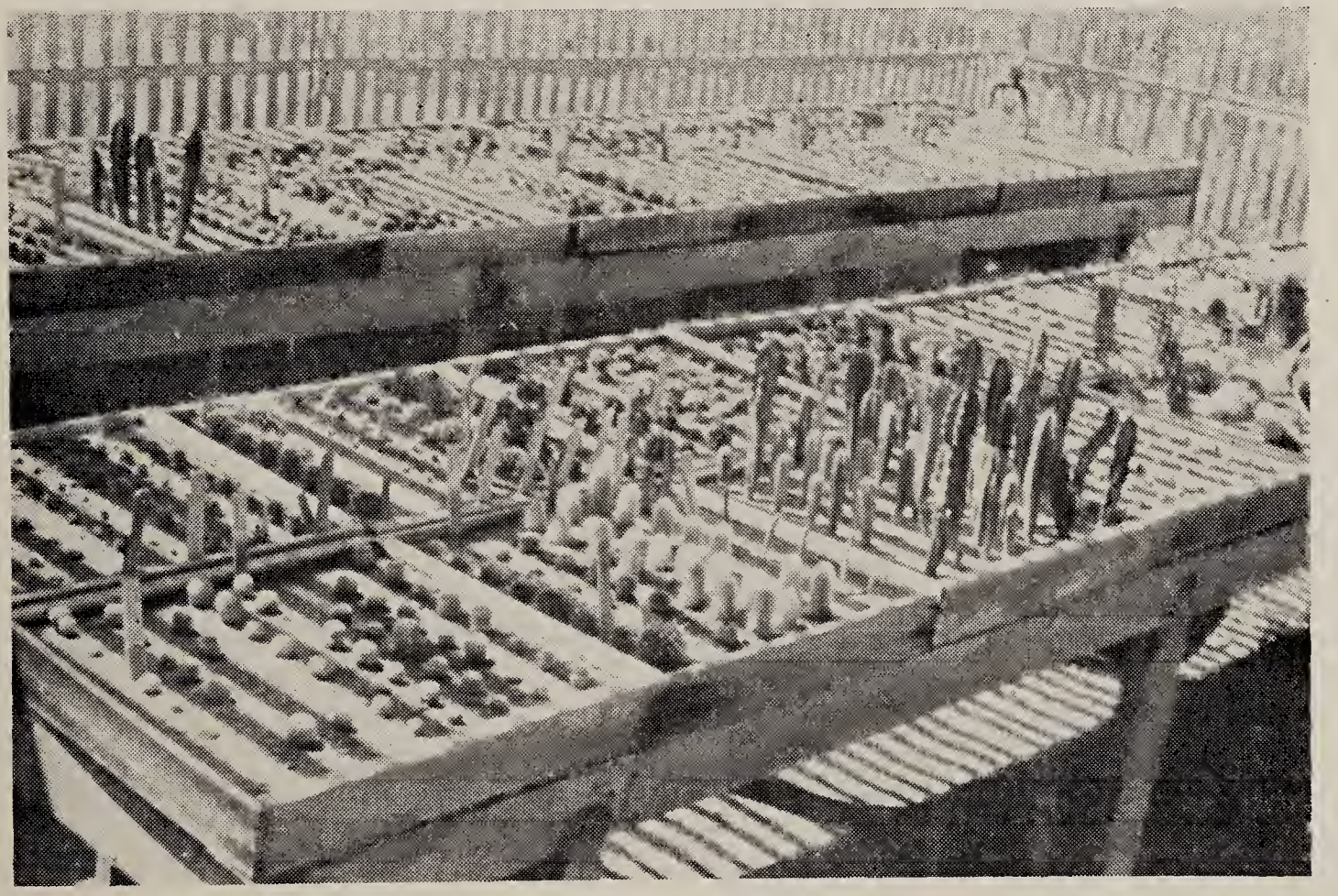
The growing of cactus seedlings is not only easy but will reward you with much pleasure for your patience. The latter part of April is a very good time to start your cactus seedlings in the Southwest, with its sunshine and warm nights. Late May or early June are better months for other parts of the United States. If you are able to supply artificial heat to your seeds then they can be started at about any time of the year. It has been found that seeds of South American cactus are an exception in that they can be started in the fall without artificial heat in our area.

It is important that seeds you obtain from your own cactus, from friends or from dealers be good and clean before you plant them as any dried remains of fruit adhering to the seed may cause bacterial action and rot the seeds. If the seeds are dirty wash them in cool water several times and then spread them out on a newspaper to dry in a well aired room.

If you want seedlings that will grow fast and tall use those in the genus Cereus and secondly those in the related Cereanae group. Seeds of the Echinocactanae are the slowest growers and may take a year to show any size.

The pots in which you place your seeds should be of a low type similar to fern or bulb clay pots having drainage holes in the bottom. The pots should be sterilized by boiling as an added precaution against fungus. In the bottom of the pot place a chard over the hole and then fill pot to ½ inch of the top with your soil mixture.

Many growers have their pet soil mixtures for the starting of seedlings. We have had good success with washed sand. On the other hand you might want to use a mixture of equal parts of leafmold, sand and garden loam to which may be added a small amount of charcoal. The mixture cannot be too fine in texture otherwise it may pack and the seedlings will not be able to get

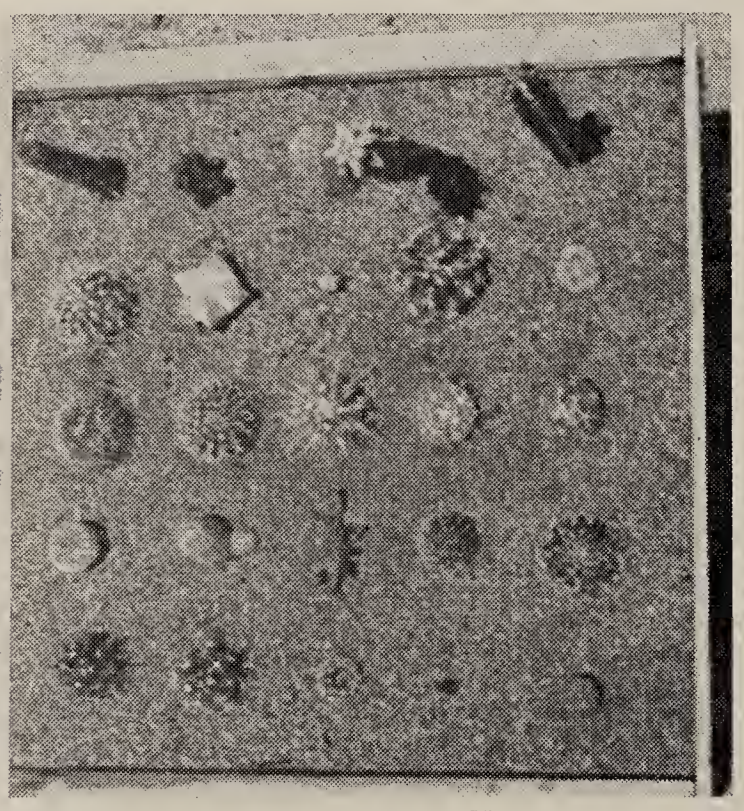


Seedlings grown by us for use in our plantings are grown in flats until large enough to plant out.

air down to their roots. It is always a good idea to bake your mixture in an oven for about an hour to kill any fungi and thus lessen any loss to your seedlings by damping-off.

When you have the pots filled, scatter the seeds over the surface and then cover them lightly with sand. Then spray the surface with "Semesan" which is a good fungicide. It is also advisable to continue the use of this fungicide at any time fungus may appear.

When you have your pots seeded place them in a pan of water so that the water will soak up thru the pot to the seeds. Never water your pots from the top and keep water in the pan or tray at all times for if at any time the seeds, during germination, should happen to dry out they are then a total loss. If the pots are placed in the sun they should each be covered with a small piece of glass which will increase the humidity. After the seeds have germinated raise the glass ¼ to ½ inch by inserting a small stick between the pot and the glass. This will then allow air to circulate around the germinated seedlings. If the sun is very hot place a piece of paper over the glass or whitewash the glass. Temperature should be between 70 and 80 degrees for good germination though most of the Mexican species of cactus germinate better with temperatures of around 100.



A flat of assorted seedlings grown by Mr. Earle for our use.

Many of the Cereus will germinate in 4-8 days; Opuntias 10-15 days; Ferocactus 12-21 days; Mammillaris 7-10 days. Most species germinate better when the seeds are about a year old. If the seeds are fresh, that is just harvested, they may germinate in good shape but the seedlings always seem to be weak and usually die out.

Many growers will begin transplanting the seedlings into flats or pots as soon as spines appear after germination. Recently the tendency has been to let the seedlings grow for 6 to 12 months in the germination pots until the seedlings are crowded thus inducing the plants to make better roots. When you transplant the seedlings place them in richer soil. Fast growing plants can be transplanted each 3 or 4 months. After transplanting growth can be increased by adding a weak solution of commercial fertilizer or liquid manure to the ground.

The amount of water can be decreased as fall arrives and it will not hurt the seedlings if they occasionally dry out during the cool winter months for the rest will do them good.

Cover Photo

Chilopsis linearis (Cav) Sweet.

The desert-willow is so called because of its willow-like leaves though it is actually a catalpa and belongs in the Bignonia family. It has catalpa-like blossoms in color from white to dark lavender and it blooms from late April to August along washes in the desert and mountains up to about 4,000′ elevation. We find it in various parts of the State and a very good stand of it is along the Hassayampa River above and below Wickenburg. An immense desert-willow of over 35′ in height is at the town of Continental south of Tucson.

This tree makes a very good ornamental and should be used because of the long blooming period of beautiful flowers. It can be started very easily from seeds or from cuttings and it is stocked by some of the local nurseries.

Escobaria tuberculosa (Eng.) B.&R.

A plant reported several times as native to Cochise County but not recently collected.

Our Cactomaniacs and members should be on the watch for this plant and advise us if it is located.

Desert Botanical Garden

Book Dept. **P. O. Box 647** **Tempe, Ariz.**

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DESERT BOTANICAL GARDEN of ARIZONA

May, 1953

REG MANNING

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Reg Manning, John H. Rhuart

Volume 7 MAY, 1953 No. 5

Table of Contents

Editorial 51
Toumeya papyracantha 51
Peruvian Night Cereus 53
Ask Mr. Cactus 53
Mammillaria lasiacantha 54
Micropuntia 55
Opuntia nicholsii 56

Desert Botanical Garden of Arizona

STAFF

Director .....W. Taylor Marshall
Superintendent .....W. Hubert Earle
Curator of Herbarium .....E. R. (Jim) Blakley

Garden hours: May 17th to June 30th. Open Saturday and Sunday only — 1 to 6 P.M.

EDITORIAL

After May 17th the Garden will be open to the public only on Saturday and Sunday afternoons from 1 to 6 P.M. during the balance of May and the month of June. We are closed entirely to the public during July and August for needed replanting and reconstruction.

Members of the Society are always welcome, even during the periods that we are closed to the general public but admission is thru the west gate only, that is the gate leading to the residences.

The Cactus and Succulent Society of America will hold a convention in Arcadia, California July 10th to 12th with field trips to Palm Springs and Joshua Tree National Monument on July 13th and 14th and to Santa Barbara on July 15th.

Many of our Eastern and Midwestern members will attend the Convention and we wish to extend to them an invitation to stop at our Garden either going to or returning from Arcadia.

We have heard from several members who plan such a visit with us and hope many more will let us know that they also will stop in to see us.

Howard E. Gates of Corona, California and Gil Tegelberg of Inglewood, California stopped over at the Garden on April 30th enroute to the Isthmus of Tehuantepec and we will be looking for them to stop again on their return six weeks later.

The American Association for the Advancement of Science held a convention of their Southwest section at Tempe in April and the Garden was a co-host with the State College.

We had about 70 of the scientists from the convention in the Garden for the larger part of one day and the writer gave an illustrated lecture on Arizona's Cactuses on the last evening of the convention.

We made many valuable contacts during that meeting and have arranged for mutual cooperation with a number of the scientists working on Arid Land problems and other subjects relative to Desert plants.

The Annual Meeting of the Society was held as scheduled on Sunday, April 19th and at that time ballots for Executive Board positions were counted and Messrs. Burrall and Rhuart were declared elected for a four year term.

At the Executive Board Meeting held the following night the current officers were reelected for one year. The President's report of the year's activities were read and approved in a resolution by Reg Manning.

As is usual, plans are being formulated for our summer research trips and this year we plan to trace the exact identity of Opuntia pulchella and a group of three species from Utah and Nevada which have been described as a new genus, Micropuntia.

We have received some fine plants from Howard Gates, including seedlings of the very rare Pachycereus orcuttii. A collection of New Mexican plants was sent by N. A. Paradine of Deming and several hundred seedlings were sent to us by Prof. Arthur Blocher of Amboy, Illinois.

Toumeya Papyrancantha (Eng.) B. & R.

Since 1894 when Engelmann described Mammillaria papyracantha in Plantae Fendlerianae based on a single plant collected by Fendler near Santa Fe, New Mexico, very few of the plants were found until recent years.

In 1936 some plants were found near Santa Fe and shortly thereafter in 1937 they were found in Arizona near Show Low by Col. Dale Bumstead.

Expeditions by the Desert Botanical Garden have located colonies of the plant at many points in the White Mountains and on the Navajo Reservation north of Holbrook. It is evident that this plant is an Arizona native with a

few very scattered colonies in New Mexico.

As first described from one plant in poor condition it seemed to be a Mammillaria and was so classified by Engelmann but in 1863 he reported that further study convinced him that the plant was an Echinocactus because the flowers are produced from the spine-bearing areole at the apex of a tubercle.

Englemann gave the size of his plant as 2 inches high and 1½ inches in diameter. Britton and Rose in Cactaceae III: 91.1922 stated that the plant grew 5 to 10 cm. high or 2 to 4 inches.

We find that it is usually 2 inches tall or very slightly over that in nature because the plant is eaten by sheep each year.

Found only in flat, high plains and growing in bunch-grass, which it greatly resembles, the aboveground portion of the stems are eaten with the bunch-grass in spring but a new stem will grow from the underground portion of the stem during the ensuing summer.

When brought into cultivation and protected against grazing the plant grows tall, some of our plants are now over 6 inches tall and still growing.

The accompanying picture shows a small plant as collected in the field and one of the larger plants grown by us. Both plants are in flower.

Seedlings grown by us as well as several seedlings collected in the field attain a height of 2 inches while the diameter of the plant is about 1/5 of an inch. At this stage the plant stops its upward growth and begins to fill out until it attains a diameter of about an inch.

From this time on the growth is resumed both upward and in diameter as shown by our picture.

The flower is a pale greenish-cream color and not at all spectacular. The flowers seem to be self fertile and a plant isolated from its fellows will produce viable seed.

The first plants collected in New Mexico in 1936 sold to collectors at $10.00 each with the demand exceeding the supply but as the collectors realized the almost certainty that Toumeyas will not thrive in any climate with a humidity of 25% or greater, the demand fell off.

Toumeya papyracantha will be an item for collectors in desert or semi-desert areas as its small size and inconspicuous flowers will tend to keep it unpopular with most fanciers.

Toumeya papyracantha (Eng.)
B. & R. Staff photo.

THE PERUVIAN NIGHT BLOOMING CEREUS

At this time of the year the many large specimens of Cereus peruvianus hybrids have begun to produce their 6 to 7 inch, white flowers. The flowers open about 9 to 11 P.M., according to the night temperatures, and close as soon as the sun's rays strike them the following morning.

The larger plants may have anywhere from 20 to 50 flowers open at once and the flowers come in "waves" about three weeks apart from late April to late September.

Almost all of the plants in the genus Cereus in cultivation have been grown from seeds supplied by Huntington Bo-

anical Gardens or by other California gardens and the seeds are all hybridized.

Very little material from South America in this genus has been imported in recent years and the older collections, such as Huntington, have been growing the plants in close proximity with the result of hybridization.

This is very discouraging to the taxonomist but is of little interest to the grower who is usually interested only in showy flowers and all of the Cereus species and hybrids produce spectacular blooms.

We have observed that evening temperatures influence the hour of flower opening which is earlier on cool evenings and later on hot evenings.

Plants of identical size, one near our Administration building and one twenty feet away show that the plants remote from the building will open its flowers several hours earlier than the one near the building which is effected by reflected heat retained by our 30 inch thick walls.

Cereus peruvianus hybrid in flower.

ASK MR. CACTUS

Desert Botanical Garden April, 1953
Tempe, Ariz.

Gentlemen:

I have a Fish Hook Pincushion cactus, brought home from Phoenix, Arizona last year. I have it sitting on a large bare table. One morning last week, I noticed an area about two feet surrounding the area on which the cactus was resting ,splattered. Also, a couple of small pools of water close to the cactus. It looked like the table had been rained on and then dried. It is an **absolute impossibility** for it to be **rain.** I have racked my brain for an answer to this mystery and the only solution I've been able to arrive at is the cactus, during the night, emitted a spray thru its "fish-hooks."

Quite naturally when I voiced this opinion, I was greeted with the most profound ridicule. Naturally, I would love to show proof that I'm not absolutely crazy.

To your knowledge, could such a thing happen? I would appreciate it very much if you would forward any

information you might have on this subject.

Thanking you in advance, I remain,

Very truly yours,
Michigan

Reply:- This will be great news to dry farmers in our western states. Just plant fishhook cactus in rows 3 foot apart each way and let the cactus water your crops.

Seriously it is not possible for a normal cactus plant to emit water through the spines or in any other manner. If I were the writer of this letter I would ask the family cat if it had been on the table during the time in question.

Mammillaria Lasiacantha In Arizona

This small, white cactus could be referred to as the pigmy pincushion as it is among the smaller species of the genus Mammillaria.

It was first described by Dr. George Engelmann in "Proceedings of the American Academy of Science" in 1856 based on collections made on the Pecos River in Texas. The species is marked by its frayed spines or hairy spines.

In 1859 in "Cactaceae of the Boundary" Engelmann recognized two varieties of the species, one of which, var. denudata, is characterized by unfrayed spines or as he put it, subnude spines. The plants found in Arizona as well as most of the plants from western Texas and New Mexico, are referable to the variety.

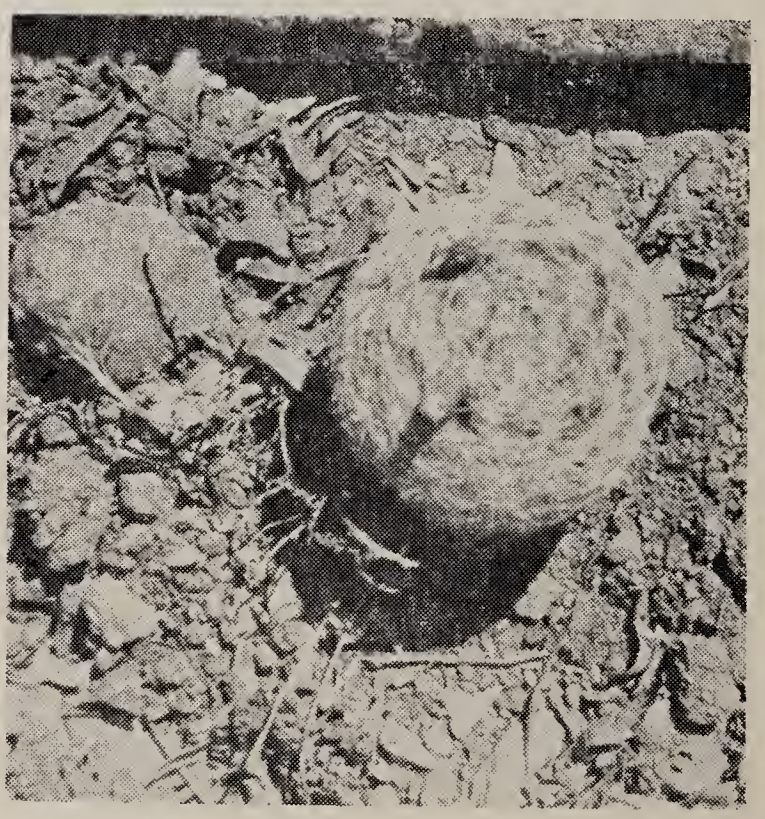
Original descriptions call for a plant about 1 inch to 1½ inch in diameter but older plants attain a much greater size frequently to 3 inches in diameter.

The little white plants are very hard to locate because of this coloration which blends perfectly with the sand and pebbles in which they are usually found. Even the small white to pinkish flowers do not cause the plants to stand out from its surroundings.

Mammillaria lasiacantha has been vaguely reported from Arizona several times but Alan Blackburn's collection from Cochise County is the only collection that has been definitely recorded and one of his plants is in our living herbarium.

Jim Blakley and the writer collected it at a number of stations in Texas and New Mexico and we also have our plants for comparison.

The pigmy pincushion is a most interesting addition to Arizona's flora and the Texas plants of the species are available to collectors and growers.



Mammillaria lasiacantha Eng.
Staff photo.

WHAT ABOUT MICROPUNTIA?

In "The American Midland Naturalist" for November 1946, J. S. Daston proposed a new genus for three species of cactus from southwestern Utah. His reasons were as quoted:- "Comparison with the genera of cacti as segregated by Britton and Rose, Adwin Berger, Marshall and Bock, C. Backeberg and F. M. Knuth and Prof. Borg indicated that these plants have claim to rank as a new genus. The plants have the characteristic roots of Pterocactus, natives of Argentina and Patagonia, but the areoles are without glochids typical of that genus. The small size and clavate shape of the branches exclude them from Pterocactus. They superficially resemble Opuntia australis Web. but that species likewise has glochids. In some respects they resemble Maihuenia of Chile and Argentina. (See Britton and Rose, Cactaceae, vol. 1) but differ in several important characteristics."

The plants were first noted by Dr. Fred A. Barkley near the Desert Experimental Range west of Milford, Utah and later collections were made at the same location by Dr. Selar Hutchings and Dr. Gordon Marsh of the U. S. Desert Experimental Range Staff. The plants were locally known as Opuntia fragilis.

In 1951 specimens of all three species were collected at a point on the road to Lehman's Cave, Nevada by Paul Hutchinson of the Botanical Garden of the University of California at Berkeley which we have grown in the Desert Botanical Garden. Other collections were made by Caroll Mills, a member of our Society near Ely, Nevada and by Edwin Weigand at an unidentified point in Nevada.

Inspection of the latter three collections lead us to believe that short glochids are sparcely present in new areoles but they are deciduous in these plants as is true of the glochids of several of the cylindropuntias.

The clavate shape of the stems, if glochids are present, would indicate that these plants belong in the genus Opuntia in the Clavatae section.

The tuberous roots are not important as such roots are frequently found on species in the genus Opuntia, for example Opuntia compresa variety macrorhiza.

Daston did not know the flowers at the time of his publication but we have flowered two of the species and find the flowers to be terminal, large for the size of the stem and a beautiful shade of deep rose.

In view of the number of questions still unanswered we plan to have a team from the Garden make an extensive investigation in both Utah and Nevada to determine the range of the species and to get photographs of the plants in place.

The photograph herewith presented represents one flower on a plant described as Micropuntia brachyrhopalica.

COVER PHOTO

Our cover shows a stem of Opuntia spinosior from the Sierra Ancha in Arizona.

Opuntia nicholii Benson.
Staff photo.

Six years ago in 1947 an expedition from the Garden found a remarkable cactus plant common south of the Navajo Bridge on Highway 89.

Many of the characteristics of both Opuntia erinacea, the grizzly bear, and Opuntia phaeacantha, the dun colored prickly pear, were observed in the plant and we considered the possibility that it was a hybrid between those two species.

Opuntia phaeacantha.
Staff photo.

However we observed on a later trip, that there were plants that appeared to be seedlings which had all of the characters of the older plants which lead us to conclude that if they were indeed hybrids the hybridization must have occurred a great many years ago for the characters to become so fixed.

In our Garden the cuttings we brought back all lived and developed into very handsome plants with large and very showy flowers usually rose colored.

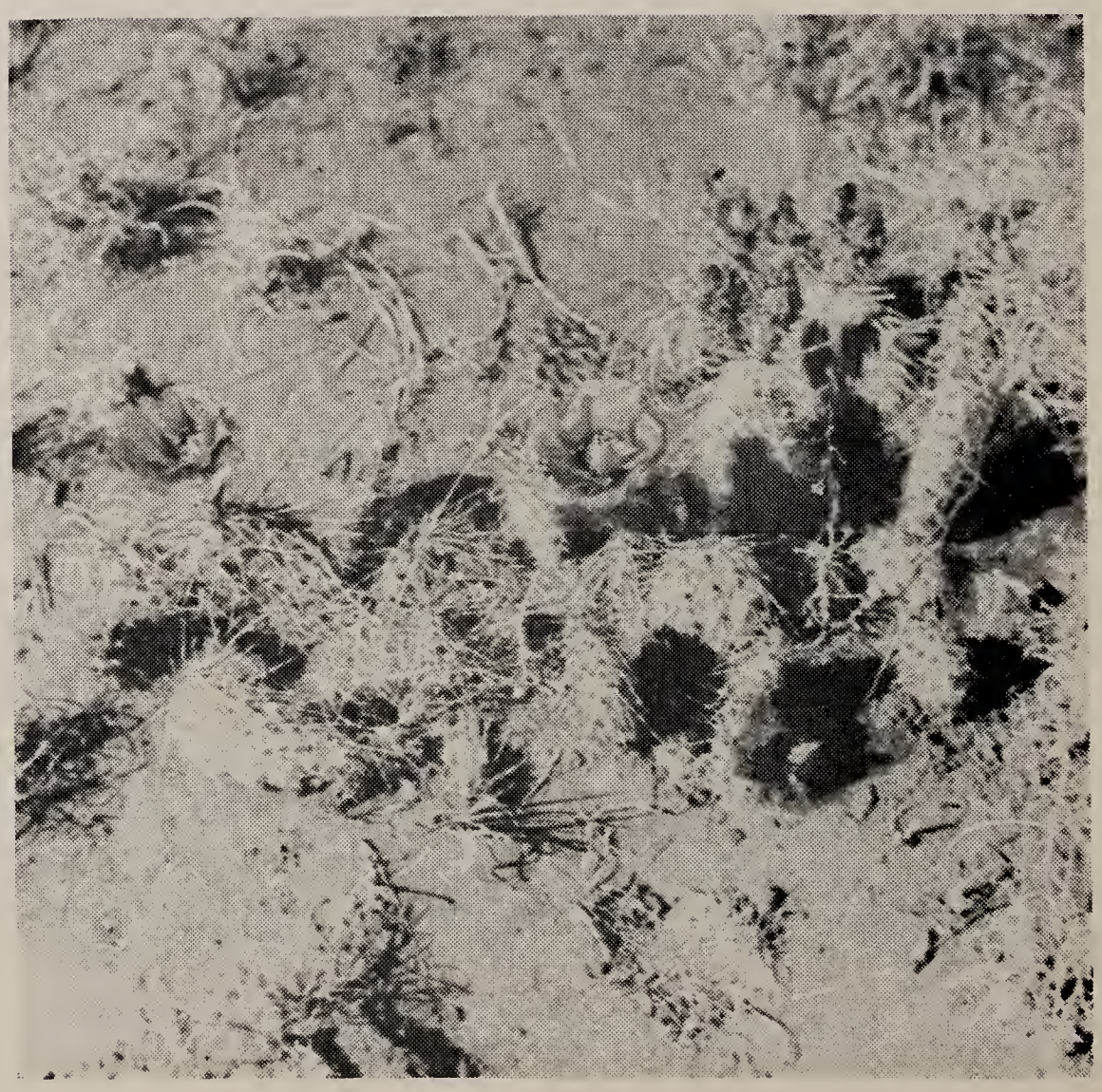
The plant consists of c h a i n - l i k e branches along the ground and rooting at the point of contact of each stem or pad. The pads are egg-shaped or narrower and quite thick with about 4 to 7 spines from each areole, the spines from the upper areoles up to 3 to 5 inches long, slightly flexible, flattened and sometimes twisted, white to gray in age but often reddish in new growth.

Dr. Benson also collected this interesting plant in 1949 but did not see it in flower. He has described if in his book "The Cacti of Arizona" 1950 as Opuntia nicholii in honor of A. A. Nichol who collected it in 1940 and made a herbarium specimen which he deposited in the University of Arizona herbarium.

Opuntia phaeacantha is found in the vicinity of Navajo Bridge but Opuntia erinacea is not now found in direct association with Opuntia nicholii although it is found ten miles south at a higher elevation.

Opuntia erinacea Eng. & Big. variety *ursina*.

Opuntia erinacea Eng. & Big. A plant of the yellow flowered race at Five Buttes, Navajo County.



Opuntia erinacea Eng. & Big. variety *hystricina* (Eng. & Big.) Benson. A plant photographed in Monument Valley. This is of the yellow flowered race.

Fig. 21. *O. erinacea* Eng. & Big. variety *rhodantha* (Schum.) Benson. A rose flowered plant photographed by R. C. Proctor.

Desert Botanical Garden

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SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

JUNE-JULY, 1953

REG MANNING

SAGUAROLAND BULLETIN

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W. TAYLOR MARSHALL, Editor

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Volume 7 JUNE-JULY, 1953 No. 7

Table of Contents

Editorial 63
Cabeza Prieta Area 64
New Variety of Cactus 67
Confusing Coryphanthas 69
Utahia Sileri 71

Desert Botanical Garden of Arizona

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Garden closed July and August. Members, Botanists and students always welcome.—Enter through the Residence gate on west side.

EDITORIAL

Summer has commenced in Arizona with the temperatures over the century mark. We are thankful for a cool spring and the fact that the first day of 100 degrees heat on June 10th was moderated by a delightful breeze.

The Garden will be closed during July and August but open to members and their friends either day or night. Use the gate to the residential area.

E. R. Blakley (Jim to us) received his degree of Bachelor of Science (cum laude) from Arizona State College in late May although he had finished his schooling in January. He now can start to acquire practical knowledge by applying the theory he acquired in his college course.

Your editor was deeply honored in May by the American Association for the Advancement of Science who elected him a Fellow of the Association in recognition of his standing as a scientist and as a spur to greater efforts in the future.

A new member of our Society would like to own a complete set of Saguaroland Bulletin from its beginning but we lack copies of three issues as follows:

Vol. 2 No. 7 September 1948
Vol. 3 No. 4 April 1949
Vol. 3 No. 6 June-July 1949

If you are willing to part with any or all of these missing numbers please write to Mr. M. C. Richter, 1701 Mission Canyon Road, Santa Barbara, California and let him know which numbers you will sell and the price you want for them.

The Mexican travellers, Howard Gates and Gil Tegelberg, stopped off at the Garden on June 12th on their return from six weeks in southern Mexico including the Isthmus of Tehuantepec. They had a magnificent collection of rare things and promise to mail back specimens to the Garden after their return home and the big job of unpacking.

They left with us one of the most unusual cactus plants that we have ever observed which we hope to have reestablished by fall opening for display to our visitors.

It is a mature plant of Cephalocereus apicicephalium Dawson. Our specimen and all the specimens collected were found on an exposed, very arid hillside where the plants mature at a smaller size than is usual so our plant, which is about 4 feet tall, has reached the maturity of a 10 foot plant under more favorable conditions.

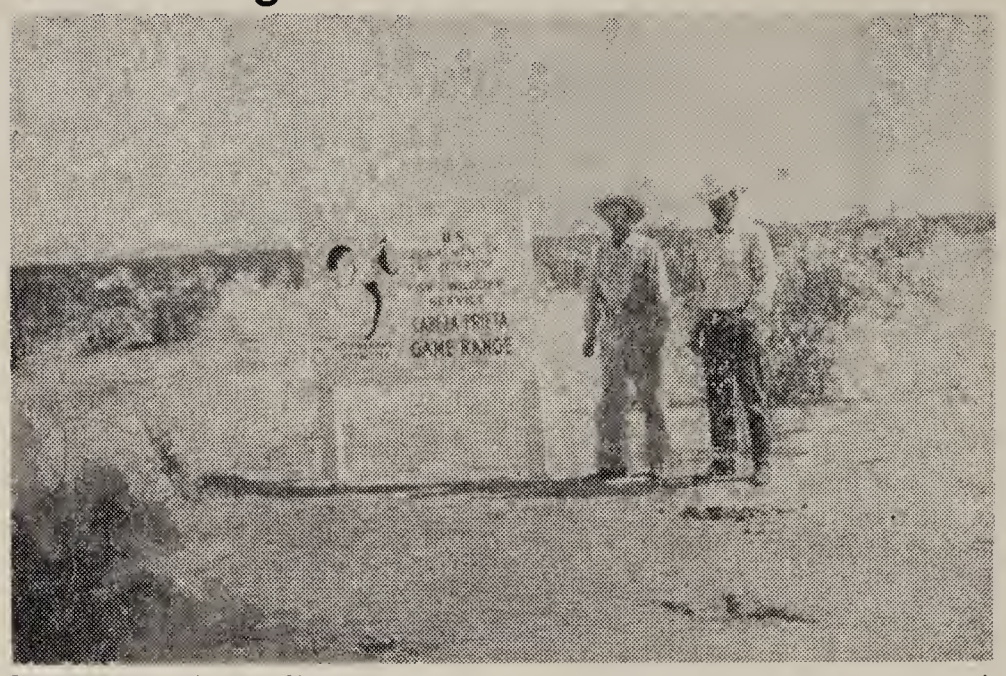
A single column of about 2 inches in diameter with many thin ribs and closely spined it produces a mass of light brown wool at its apex and the flowers are borne in that wool.

After producing its flowers the stem then grows through the wool which then remains as a collar around the plant and the ripening fruits project from this collar. The following year another mass of wool forms at the apex and produces more flowers. This in turn is grown through so that in age the plant may have many collars of tawny wool at intervals of 2 to 4 inches when it looks like an oversized bottle brush.

Our plant now has one collar and apical wool and is valued as our most interesting plant. We have a number of collected seedlings of 6 to 9 inches in height which were sent to us some time ago by Mr. T. MacDougal who collected them in Mexico. It will require many years for the seedlings to reach flowering size. Meanwhile we will try to have a picture both of the seedlings and of the mature plant for our next issue.

Mr. Paul Hutchison of the Botanical Garden of the University of California at Berkeley brought us nine other rareties which we will describe in our next issue. Paul accompanied us on the Utah-Nevada trip and took over and finished the trip for us as well as for the University when a severe asthma attack due to high altitude and damp air compelled me to leave the expedition at Cedar City, Utah.

Botanizing In The Cabeza Prieta Area



Entrance to Cabeza Prieta Game Range set up for the preservation of Desert Bighorn Sheep. "Ace Kempton left and Huyson Johnson right Photo by McCleary.

In the southwestern portion of Arizona in Yuma County, along the international border, lies one of the most interesting and unique regions of the entire west. Here, in a region noted for its extreme heat and scarcity of water, is found a large concentration of the Desert Bighorn sheep. In order to preserve and to increase the number of these animals, watering tanks are being built in many of the desert mountain ranges by federal funds in the Cabeza Prieta refuge and by state funds in the Kofa refuge. Not too much is actually known concerning these animals. Their range includes regions as near as Phoenix as well as within the Grand Canyon. They drift out of Mexico during the winter months and return during the summer. It is known that some of them stay in Arizona during the entire year. It is to encourage this latter habit that many tanks are being built in almost inaccessible areas. The plant life of this area is also unique. Probably most of the flowering plants are known, but the non-flowering plants, particularly the mosses, liverworts and lichens have only been studied incidental to the higher forms. In order to obtain specimens of these groups, the author has long tried to find the time and means of collecting in these desert ranges. Certain difficulties are readily apparent by quick reference to any oil company road map. Warnings are given as to time of travel, the scarcity of water and gasoline, and the need for guides. In addition, the United States government, in the form of the air force, has set aside much of Yuma County, including the game refuge, for a gunnery range. Because of this, no active work is being done on the refuge and only one man is assigned to an irregular checking of the tanks and the movement of the animals.

Huyson Johnson, a May graduate of the Arizona State College at Tempe had previously been employed on the refuge. It was at his invitation, that Dr. Tom Barrett and the author made a weekend trip to the region.

Consequently, one Thursday afternoon in March, the three of us, Huyson Johnson, now of Tishimingo Fish and Game Refuge in the State of Oklahoma; Dr. Barrett, of the Agriculture Department of Arizona State College; and the author; left Tempe in a Chevrolet Suburban belonging to the college. Arriving in Gila Bend we met "Ace" Kempton, supervisor of the Cabeza Prieta Game Refuge. Mr. Kempton epitomizes the best of our so-called public "servants." Although not far from retirement age, his activities are those of a man thirty years younger. He can drive the "power wagon" all day, chop wood, hike and climb for hours without the slightest display of fatigue. His sense of

humor also belies his grey hair.

After buying enough supplies for twice the number on the trip, we proceeded by caravan to Mohawk where we gassed up and then some miles beyond turned south across the Southern Pacific tracks and left civilization behind. We were not to see any human being until Sunday afternoon and 600 miles of unpaved highway later. Of course, the term road is only a courtesy name as no grading is ever done. The car wound back and forth, being scratched by Larrea and occasionally by an Acacia or Prosopis. The entire region is classified by Forrest Shreve in his **Vegetation of the Sonoran Desert**, as the Lower Colorado Valley or Larrea-Franseria region. The Franseria is the species dumosa and not F. deltoidea of the Phoenix area. Although a large number of ephemeral herbaceaus species are common in this ecological subdivision, in this spring, this was not the case at the present time. Lack of moisture (the average annual rainfall at Yuma is approximately 4 inches a year) has affected even the most xerophytic plants including Larrea. This latter species was a yellowish-green rather than the dark green which is characteristic of the plant when moisture is sufficient. The trace wandered through the broad Mohawk Valley with the Mohawk Mts. to the east and the Copper Mts. to the west. Through this area the desert floor is fairly firm, few sandy stretches being met.

Just as darkness was falling, we came to a side lane. Huyson and I left the Chevrolet to climb into the bed of the "power wagon" and we digressed 5 miles to examine a new tank which is near the northern end of the Sierra Pinta Mts. The tanks are built in various ways. Sometimes it is a dam, placed at the base of a rocky draw, at other times is is a hole actually blasted into solid rock. The bottom slopes in order that an animal which may fall into the tank can climb out if he is unharmed. The North Pinta tank, as this one is known, unlike any other that we saw, has a corrugated iron roof, supported by steel pipes over the tank to reduce evaporation due to the intense sun. All tanks are placed in such a position that water from a large drainage area will be channeled into it.

Leaving the tank we returned to the road fork and proceeded south again between the Sierra Pinta and Cabesa Pineta Ranges until we came to Tule Wells, our base camp.

Tule Wells in itself could be the subject of a tremendously interesting report. One of the stops on the old "Camino Diablo" route, it has served as a base for immigration authorities, Border patrol, hoof and mouth disease control station, and various other agencies. At the present time the station consists of a one room aluminum covered building and a windmill pump. South, in the distance, rise mountain peaks in Old Mexica.

After a long night's sleep and a leisurely breakfast, we proceed westward to the Tinajes Altas Mts. It is in this region that many large spreading clumps of Opuntia stanlyi, var. wrightiana and Echinocactus polycephalus are to be found.

The Tinajes Altas tanks form a series of enormous steps down from the tops of the mountain to the outwash plains at the base. Not only were there evidences of many sheep present, but a number of Indian grinding holes are to be found. The Tinajes Altas Mts. are mentioned very prominently in early botanical history indicating the importance of the tanks to the earlier travelers.

Most of the early afternoon was taken up with the journey northeast to the center of the Cabeza Prieta range to examine the tank of the same name. In each case where tanks were seen, due to the topography and the resulting increase of moisture plant collecting was better. Collecting of mosses was best below the tanks where there was some seepage of water. This tank was made by building a cement dam of about 12 feet in height. As the area behind the dam was bare rock with no soil on the

surface, no silt collecting basin was needed. It was at this tank that a drowned ram was found and removed. Fortunately the writer was above the tank at the time and was not able to view (or smell) the remains. Here a number of moss specimens were collected, chiefly species of Bryum. Bursera Microphylla is very prominent around this area. To reach this tank without a guide would be next to impossible as the "road" was practically nonexistent. From the point where the truck stopped it was necessary to hike in about ½ mile. The amount of labor involved in building one small tank in such a remote region is tremendous.

The third and last tank visited on Friday was Buckhorn Tank, also in the Cabesa Prieta Mts. It was composed of two sections. The upper portion was a silt trap. Due to moisture trapped in here a large number of plants were supported close to the edge, chiefly Yuccas and various Opuntias. As water poured over this dam it fell into the tank below where the force of the falling water was great enough to throw out the sand and gravel.

Saturday morning the group went to Heart Tank in the Sierra Pinta Mts. This was one of the most difficult to get to due to its position halfway up the side of the mountain. A marvelous view of the Tule desert can be had from here. It was at Heart Tank that the only live sheep were observed. On the outmost plain below were magnificent specimens of Beleperone (Hummingbird Bush), Ocotillo and various trees and shrubs. An interesting plant, Sapium biloculare reaches a height of about 12 feet here. This is a member of the Spurge family and is commonly called "Mexican Jumping Bean" because the seeds are infected with a larva. (This

Echinocactus polycephalus
A plant from the Tule Mountain country mentioned by Dr. McCleary in his article.
Staff photo.

is not the plant which is widely known as the jumping bean however). Kearney and Peebles in their book **Arizona Flora** report that the juice of the tree is used to stupefy fish as well as being used by the Indians to poison their arrows.

That evening, while waiting for Ace to broil steaks over an open ironwood charcoal fire, Huyson and the writer rode to the Tusseral Mts. (Tule Mts.) nearby to examine the Tusseral tank. This tank had been blasted out of Solid rock but had developed a fault which allows water to slowly seep out so that it was completely dry at that time.

Breaking camp on Sunday morning, we traveled eastward; alternating between the Camino Diablo and the jeep road bulldozed for the hoof and mouth disease patrol. For many miles we were within a few feet of the international border. Something of a surprise to the writer was the large number of volcanic cones which are found along the border. This Black Mesa may be an extension of the Pinacate Lava flow which extends out of Mexico. After climbing one of the cones and taking pictures, we traveled on eastward to cross a large sand dune which extends for miles from the Gulf of California up into Arizona. This as well as the Lava flow supports its own distinctive vegetation. Encelia farinosa and Encelia frutescens are common in the malpais areas while Hilaria rigida, Dalea emoryi, and Hymenoclea monogyrea are common on the dunes.

By late afternoon we had reached the Organ Pipe National Monument where the first person that we had seen for three days was the Monument director.

Although no real difficulties were encountered on the trip it may be well to remind readers of this article that we found many evidences of firing on the area in the form of spent shells and machine gun clips. Fortunately we were not under fire. The power wagon carried extra tanks of gas and water and for a distance of about two miles the power wagon pulled the Chevrolet suburban through the dunes. Travel in the area is hazardous and not to be tried without proper guidance and equipment.

ECHINOCEREUS TRIGLOCHIDIATUS var. MULTICOSTATUS

(Schum.) Marshall comb. nov.
Cereus leeanus Hooker 1849
Echinocereus leeanus Lemaire 1885
Echinocereus multicostatus Cels 1885
Echinocereus leeanus multicostatus Schumann 1898
Echinocereus leeanus Britton & Rose 1922

An erect cactus of few cylindrical stems up to 12 inches high and 2½ to 3 inches in diameter.

Ribs 8 to 14 with areoles or spine cushions fairly closely set on the apex of each rib, the areoles bearing some wool and 10 to 13 acicular spines, the radial and central spines much alike.

Flower very large for the red flowered species and broadly companulate or bell-shaped while other species of the relationship bear narrowly funnelform flowers. The color of the flower is flame, the size 3 inches in length and 2½ inches in diameter. The pistil and styles are included and about equal in length. The flowers are open day and night for 5 to 7 days.

The plant was first decribed by Hooker in Curtis's Botanical Magazine in 1849 and the description was based on a plant presented to Kew Gardens by James Lee, owner of a commercial plant establishment at Hammersmith for whom it was named. The plant was said to have come from France with the place of origin simply given as Mexico.

The species was not known to Britton and Rose but was listed by them with a copy of a picture from Curtis's Botanical Magazine which accompanied the original publication. This illustration shows a hot-house grown plant somewhat etiolated and is described as having a tapering stem, a character not found in field grown plants.

Cels in Forster Handbook Cactus, second edition, published Echinocereus multicostatus from other plants of the same importation and Schumann in Gesamtb. Kakteen 1898 reduced Cels plant to a variety of leeanus. Therefore in reducing Hookers plant to a variety of Echinocereus triglochidiatus we must pick up the varietal designation of Schumann.

The plant was first brought to our attention by the flowering of several speciments sent to the Desert Botanical Garden by Lloyd Pierson, Archeologist of the National Park Service and presently at Montezuma Castle National Monument.

Mr. Pierson collected the specimens he sent us at a point 1 mile south and 2½ miles east of Anthony, New Mexico, but in Texas, in the Franklin Mountains in December 1950.

His plants flowered in April 1953 and we were at once struck by the unusual size, color and shape of the flower which in many respects differed from all of the other varieties of the widespread E. triglochidiatus. A search of the literature revealed the prior publication of the exact plant and we then proposed the recombination of Echinocereus triglochidiatus Engelmann variety multicostatus (Schumann) Marshall.

In addition to the illustration quoted above there is an excellent line drawing of the plant in Schumann's Gesamtb. Kakteen, illustration 49 showing a plant without the etiolation shown in the Curtis illustration.

Forster describes both Echinocereus leeanus and E. multicostatus but does not illustrate either.

The place of collection of our plant was in northern Mexico in 1849 when the species was first described and assigned to that country.

Thornber & Bonker in "The Fantastic Clan" 1932 illustrate and describe Echinocereus leeanus which they call the Salmon Flowered Hedgehog. They state that the plant is not a native of the United States but was found in cactus gardens in Arizona and California.

At about that time a plant with salmon, brick red or orange flowers was common in gardens under the name of Echinocereus rosei. These plants were collected at Agricultural College, New Mexico, the type location of Wooten & Standley for E. rosei and very close to the point of collection of our plant.

Both E. leeanus and E. rosei were separated from the other red flowered Echinocerel (now united under E. triglochidiatus) by the presence of short white hairs with the spines on the ovary and the flower tube.

It is possible that E. leeanus has been in collections for years under the name E. rosei. Mr. Paradine of Deming, New Mexico will collect a number of the plants now going under the name of E. rosei for us and we should be able to supplement this report after we flower his material.

Echinocereus triglochidiatus var. multicostatus

CONFUSING CORYPHANTHAS

For about six years the Staff of the Desert Botanical Garden aided by several collectors has been interested in Coryphantha muehlenpfordtii and its close relative Coryphantha robustispina. In 1948 we had flowers on several individuals reputed to be of each species and collected in eastern New Mexico and Arizona respectively.

We noted that the flowers were identical and that on both species the scales on the flower tube and both the inner and outer petals had lacerated edges.

We also found that in both species tiny glands were located in the grooves on the upper side of the nipples but these glands were noticeable only at flowering time when they were actively exuding a resin like substance.

The nipples are conic in shape on young plants of each species but on older plants the nipples were in approximation to each other and then were laterally flattened.

Coryphantha muehlenpfordtii
var. robustispina
Staff photo.

In other words the two species are identical in all important factors and differ only in spination, C. muehlenpfordtii has acicular spines sometimes rather heavy, which are usually straight or at most slightly curved. There are 6 to 16 radial and 1 to 4 central spines.

Coryphantha muehlenpfordtii
A plant collected at San Simon, Ariz.
Staff photo.

C. robustispina has subulate spines and less of them and the base of the spines are bulbose. The one central spine is curved or even hooked.

We believe that the older specific name C. muehlenpfordii should be retained for both the plants with a varietal designation for the other, C. muehlenpfordtii var. robusispina.

Britton and Rose in Cactaceae, Volume 4 in their notes on Coryphantha muehlenpfordtii say:

"There has been considerable confusion regarding this species, which was first described as **Mammillaria scheeri** by Muehlenpfordt in 1847, but this proved to be a homonym. This led Poselger in 1853, when he transferred the species to **Echinocactus**, to publish it as **E. muehlenpfordtii.**

Dr. Engelmann in 1856 described a variety of **Mammillaria scheeri,** calling it **valida.** Some time afterwards he compared this variety with the type of the species and decided that they were the same. We have examined several specimens from near the type locality of the variety **valida,** which is near El Paso. Texas.

It is possible that Scheer's plant was a young one, which might account for the differences in form and spines. The **Mammillaria scheeri** of Schumann's Monograph is a complex of 4 to 5 distinct species."

They list six illustrations: Allg. Gartenz 15: 97, pl. 2; Forster, Handb. Cact. ed. 2. 406. f. 44; Schumann, Gesamtb, Kakteenk 485. f. 80; Monatssch. Kakteenk. 8: 23: 10: 127; Schelle, Handb. Kakteenk. 237. f. 153, as **Mammillaria scheeri.**

Three of these books are in our library and we note that the Forster illustration is one of Coryphantha macromeris, Schumann shows Coryphantha poselgeriana and Schelle shows Coryphantha robustispina. Britton & Rose show an excellent picture of Coryphantha muehlenpfordtii.

Even Coryphantha robustispina has provided difficulties for the type locality was first given simply as Sonora, Mexico but this was later amended to "south side of the Baboquivari Mountains in Sonora." The Baboquivari Mountains are in Arizona but the southern tip of them extends across the line into Sonora.

Britton & Rose in their notes on Coryphantha robustispina say:—"We would refer here specimens from Lordsburg, New Mexico, and Bowie, Arizona, which we have heretofore referred to Mammillaria valida now Coryphantha muehlenpfordtii." We believe them to have been right on their first guess as all the many collections we have had from Lordsburg and near Bowie are certainly Coryphantha muehlenpfordtii.

Several hundred plants have been studied before reaching the above conclusions.

Coryphantha muehlenpfordtii var. robustispina
Another plant from Santa Cruz County in which a few curved spines are noted.
Staff photo.

UTAHIA SILERI (Engelman) Br. & R.

Utahia sileri

This plant has accepted its new home at the Garden and is prospering. Staff photo.

This plant is rare in collections and possibly always will be because it does not respond to cultivation.

Although its range is strictly limited to the foot of the Vermillion Cliffs in northern Arizona the plant is plentiful in its range.

The lower strata of the Vermillion Cliffs is a gray clay containing a high percentage of gypsum while the cliffs themselves are brilliantly red. It is only in the gray soil that Utahia is found. You might say the plant is solvent. At least it is never in the red.

First described from Pipe Springs and Cottonwood Springs in "southern Utah" by Engelmann in 1896 the plant was never again collected until it was relocated by Wright about twenty years ago. It has since then been frequently collected but does not live long in captivity.

Because the type location was given by Engelmann as southern Utah, Britton & Rose when erecting a new genus for the plant selected the name Utahia.

However, the plant is found only in Arizona and just south of the Utah line in what is called the Strip Country of Mojave County.

Mammillaria-like in general appearance, Utahia bears its flowers from the spine areoles at the apex of its tubercles. The flower tube and ovary are densely covered with overlapping, fringed scales. The flower color is a pale yellow.

In color the plant exactly resembles the gray soil in which it grows and most of its spines are also gray with a few black tipped centrals.

Desert Botanical Garden

Book Dept. P. O. Box 547 Tempe, Ariz.

PACKAGED CACTUS PLANTS

Attractive packages with cut cellophane packing.

		Price	Postage*
No. 1	5 year old Saguaro Seedling 2" high	.50	.10
No. 5	5 plants	1.00	.30
No. 10	10 plants	1.50	.40
No. 10W	10 white spined plants, collectors items	3.00	.40
No. 15	15 larger plants	2.50	.50
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No. 24	24 large plants many of flowering size	7.00	1.00

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paper binding	1.00	.15
cloth binding	2.00	.20
A description of all of the species native to Arizona. 60 ills.		
Flowers of the Southwestern Desert—Dodge	1.00	.15
Flowers of the Southwestern Mesas—Patraw	1.00	.15
Flowers of the Southwestern Mountains—Arnberger	1.00	.15
Poems of the Desert by Lou Ella Archer. Cloth bound, beautifully illustrated in color		
Canyon Shadows	2.00	.10
Sunsets to the Southwest	2.00	.10

Gift Suggestions

	Price	Postage*
Prickly Pear Delight— A Turkish delight type of confection made from prickly pear cactus fruits, provocative flavor		
½ pound box	.85	.20
1 pound box	1.60	.30
Prickly Pear Jelly— 4-12 oz glasses in shipping carton. A clear red jelly of exceptional flavor	2.35	1.00

* Postage and wrapping charges.

SEEDS

Many letters have reached us asking where seeds of cactus and other succulent plants could be obtained and we have known of no reliable sources of wide selection.

We have just received a list quoting both cactus and many other succulent seeds both in wholesale and retail lots.

Dealers may get the wholesale list by writing on their business stationery and growers can get the retail list by writing to E. Thiebaut, 30, Place de la Madeleine, Paris, 8, France.

Catalogue and quotations in French and French currency but listed under proper Latin botanical names.

Both catalogues may be seen at the Garden if you care to come out to look at them.

Cover Photo

Ten large, white flowers are open at once on a plant of **Eriocereus jusbertii.**

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

AUGUST-SEPTEMBER, 1953

Echinopsis Imperialis Hort.

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

Arizona Cactus and Native Flora Society

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Volume 7 AUGUST-SEPTEMBER, 1953 No. 7

Table of Contents

Editorial 75
Echinopsis Imperialis 76
Mimicry Mesembs 76
International Organization 78
Garden Visitors 80

Desert Botanical Garden of Arizona

STAFF

Director .....W. Taylor Marshall
Superintendent .....W. Hubert Earle
Curator of Herbarium .....E. R. (Jim) Blakley

Garden closed till September 12th. Open Saturday and Sundays only during September. Members, Botanists and students always welcome.—Enter through the Residence gate on west side.

EDITORIAL

This issue of the Bulletin is to be mailed about September 1st and the Garden will be closed until Saturday, Sept. 12th, when we commence the fall season by opening each Saturday and Sunday from 1 to 6 P.M. until October 17th, when we commence our winter schedule and the Garden will thereafter be open from 10 A.M. to 5 P.M. every day except Monday.

We will have four new beds in the grounds and a great number of new plants in the lath-house for the inspection of our visitors.

Weed cover will be left on the beds outside of the lath-house until early October to protect the smaller plans from sunburn but the garden will be in weedless condition for our winter opening on October 17th.

During this summer we have added a considerable number of plants collected by our own staff in Arizona, California, Utah and Nevada. We have also over 300 species new to us that we received from the University of California Botanical Garden at Berkeley, California, through the courtesy of Dr. Goodspeed and Paul Hutchinson.

We have also received an extensive collection of Mexican plants from Howard E. Gates as a result of his trip with Gil Tegelburg. Seedlings have been received also from Prof. Arthur Blocher, Amboy, Illinois.

The Garden is now equipped with an intercommunication system which connects the residences, the herbarium and the lath-house. This very great convenience was the gift of John H. Eversole, Chairman of the Board of the Society and we are very much indebted to him for it.

Jim Blakely has called to my attention that in the past three years we have doubled the number of species of succulent plants in our collection. In that three year period we have added as many species as had been acquired in the first twelve years from 1938 to 1950.

Mrs. Homer Lininger of Tucson has presented us with a very attractive plate glass showcase for the book store. This case will add to the appearance of our little store and, we hope, will increase sales of books.

Work on the extension of McDowell Road past the north boundary of the Garden is progressing rapidly and this winter will see its completion. At that time McDowell will become the main approach to our Garden as it is less than ¼ mile from the highway to our Lath House.

We should therefore be working on our new parking lots which we plan to have near the Lath House with our Book Store and main entrance at that point. Unfortunately we are not in a position to afford the work now.

This new approach and parking space will be our prime objective for 1954 and our success or failure will hinge on the membership.

We could readily do the work if we had 200 to 300 additional members and additional members are largely recruited by the old members of our Society.

You can help by interesting your friends to become members also. Also contributions to the Garden are deductable from income tax returns and in addition members have the satisfaction of aiding a civic project which is doing much to sell Arizona and the Desert to our winter visitors.

Why not resolve to interest several friends in memberships in the Garden?

Desert Botanical Garden
Dear Sir:

I have a project in biology to do a paper on cactus. Please write me all you know about Cactus.

Your friend,
South Carolina

COVER PHOTO

This issue we illustrate a plant of Echinopsis imperialis Hort. during one of the many flowering periods that occur at intervals through the spring and summer months. Twenty flowers were open the morning we took the picture but a few weeks before this same plant had twenty-six flowers at once.

The plant pictured has about four branches, the branching from ground level and the branches parallel, the largest over 2 feet tall and about 4 inches in diameter and having about 11 rather low ribs.

The spines are short and straight. Radial spines about 8 or 9, central spines 2 or 3.

The flowers are borne in a circle near the top of each stem and open about 9 P.M. to remain open for several days in Spring but only until the following morning about 10 o'clock in hot weather. They are perfumed and about 9 inches long and 9 inches wide when expanded fully.

The name Echinopsis imperialis was given by the late Dr. R. W. Poindexter to the plant which was produced from seed imported under the name of Lobivia cylindrica by E. C. Hummel in 1933. The description by Dr. Poindexter appeared in Cactus & Succulent Journal, December 1935.

Dr. Poindexter said "On account of its magnificent flowers, ease of cultivation and distinct individuality, Mr. Hummel's origination is destined to be of great horticultural value as well as being of scientific interest on account of its wide departure from Echinopsis types. Although its origin is shrouded in mystery and the possibility of its having originated as a garden cross is hinted at in the note referred to, there is a possibility that it may turn up some day as a natural species."

The plant illustrated was given by Dr. Poindexter to the Marshall collection about 1936 or 1937 and has been grown in my Los Angeles garden until 1948 when it was moved to the Desert Botanical Garden. The plant is therefor about 15 years old.

There is a marked resemblance between this plant and seedlings of Trichocereus purpureopilosus Weingart 1930 in our collection although these seedlings are still small. A plant received from A. F. Buining from Holland under the name "Cereus giganteus" also bears a strong resemblance to E. imperialis but the C. giganteus has not flowered for us.

E. imperialis is a most desirable plant for cultivation in Arizona outdoors as it will take frost and more sun than most species of Echinopsis.

MIMICRY MESEMBS

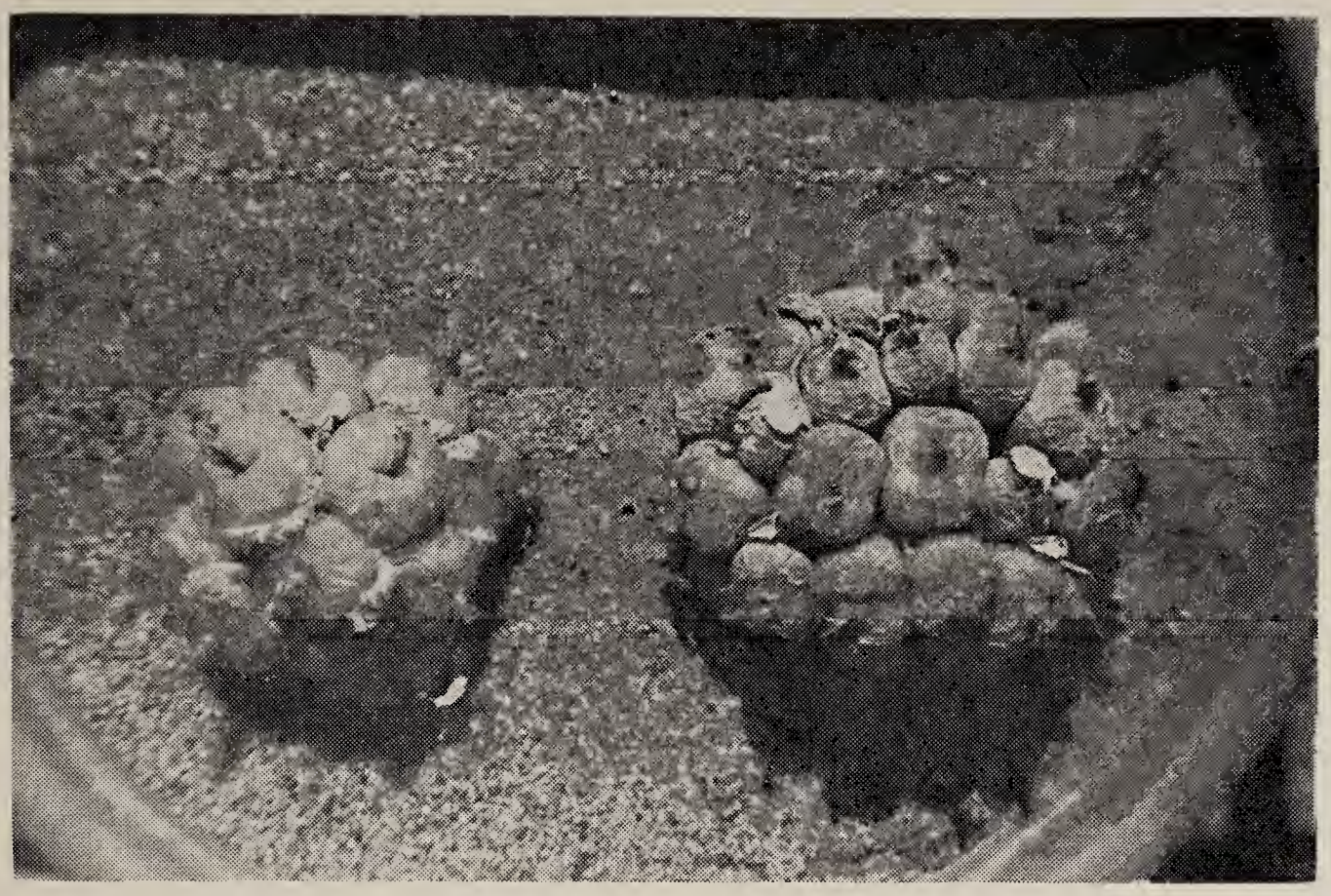
In the Fig Marigold Family we find many types of plants ranging from fairly large, leafy shrubs and ground cover plants with very succulent leaves to the mimicry plants which closely resemble the pebbles of the South African deserts on which they reside.

These mimicry plants are extremely interesting and so small that a large collection of species can be grown in a window box. That they have not attained greater popularity can be explained by the fact that they differ from all other plants in their cultural requirements and too little has been written on those requirements.

For five years we have grown a number of species, brought from my Los Angeles Collection, in several genera at the Garden and our greatest difficulty has been to restrain our staff members from killing them by kindness.

During the summer months, from late April or early May the plants must be kept dry and allowed to dehydrate to the point that they resemble parchment.

In the fall, about September, we start to supply a little water and the plants respond immediately to the treatment and begin to take on new life and finally send up new leaves which are plump and colorful.



1. Conophytums, right — C. giftbergensis, left — C. braunsii, just going into rest.

To assure dryness we have built a top cover of plastiglass over the pots in which we grow these mimicry plants to assure that no water will be supplied by our occasional summer rains.

During this rest period the plants certainly look as though they were dying but this is perfectly normal condition which they go through in their habitat. Even at the dryest stage the plants are interesting to our visitors who often ask why we keep dead plants around.

So far the mimicry plants have been kept in our propagating room where not too many visitors get to see them because we have found the loss too great if exposed to acquisitive collectors. We plan to have them in a specially built case for display next winter but so arranged that they cannot be touched or "borrowed."

As the extreme in water storage in leaves the species deserve careful inspection. It will be noted that the flat upper surface of each leaf is windowed to permit sunlight to penetrate to the center of the leaves and by the sun's action on the green coloring matter in them (chlorophyll) to convert the minerals, carbon dioxide and water taken in by the roots into energy foods for the plants growth.

The leaves are always in pairs, usually separated distinctly, but in some genera united into a disc with a separation only at the center of the disc which resembles an umbillicus. In Fenestraria the leaves are club shaped with flattened tops and the windows are pronounced.

Our first large collection of mimicry mesembs was presented by the Johnson Cactus Nursery in January 1951 for use in the Cactus Show of that year. The plants illustrated herewith were in that collection.

Recently we have received an additional collection of 46 species from Mr. Al Irvine of Alameda, Calif. which we hope to have on exhibition for the coming winter season.

Photo No. 1 represents two species of Conophytums, the one to the right well advanced into resting condition.

Photos 2, 3 and 4 show species of Lithops and photo No. 5 shows a well grown pot of "baby toes," Fenestraria rhopalophylla.

Photos by E. R. Blakley

INTERNATIONAL ORGANIZATION

The International Organization for Succulent Plant Study, called the I. O. S., is a group of specialists in the botanical sciences banded together for mutual aid in solving taxonomic and genetic problems. Membership is by invitation only and the present membership represents Britain, Holland, France, Monaco, Germany, Switzerland, Argentina, Spain and Australia.

The second Congress of the I. O. S. will convene at Monte Carlo on September 21st to 24th under the joint auspices of the Government of Monaco and the Jardin Exotique.

Mr. H. M. Roan, editor of Repertorium Plantarum Succulentarum published by the British Section of the I. O. S. has written to suggest that I should be a member of the organization and possibly attend the meeting at Monte Carlo.

My attendance at Monte Carlo is not possible this year but I have told Mr. Roan that I would like to suggest in a prepared paper some of the very interesting findings that we have made by calling on Chemists and Geneticists here and of the tremendous variation we have noted within a species due to geographical position, altitude and annual rainfall.

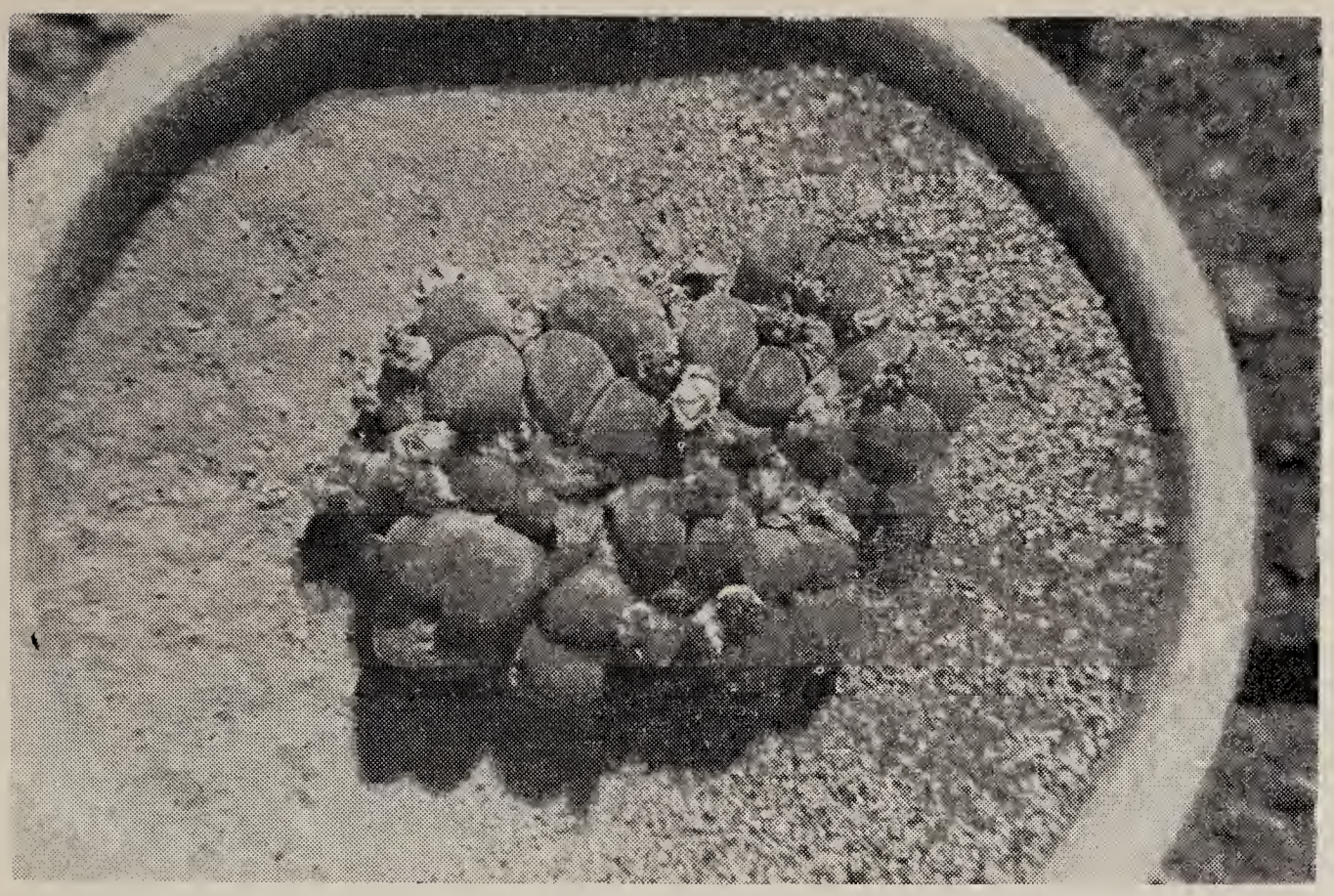
Much of the information on variation within a species is contained in the manuscript of the second edition of our "Arizona Cactuses" but still more facts will be mentioned in this paper.

That the Chemist can throw light on relationships between species within a genus can be surmised by the following quotes from letters recently received by us:

Wayne University
Dept. of Chemistry

We have some information now about Lophocereus schotti, L. gatesii, and L. australis which I think will interest you. It seems that the main isolatable compounds from L. schottii and L. australis are almost identical, i. e. the alkaloidal fractions are apparently different but the main fraction (we have called it Lopherol) is present in both species in approximately the same

2. Lithops aucampiae



3. Lithops salicola

amount.

L. gatesii on the other hand contains less alkaloids and certainly no Lopher-ol. Have you any evidence that L. gatesii is incorrectly classified?

Yours sincerely,
Alan J. Lemin.

In this case the evidence is that L. schottii and L. australis are very closely related, possibly conspecific, while L. gatesii is certainly a distinct species as it conforms to the characters set up for the genus Lophocereus namely: flowers multiple from an areole and only from areoles with long flexible spines which are produced on the upper portions of stems while the lower part of the same stem produces fewer and shorter as well as differently shaped spines (subulate).

L. australis may be a variety of L. schottii although the growth habit is quite different and L. australis is tree like in growth with a short but definite trunk and it retains this growth habit after 14 years in cultivation. L. schottii lacks the trunk, has much heavier branches and all branches arise from the ground level.

In another instance Chemistry offered confirmatory evidence. We have considered Mammillaria heyderi, M. applanata and M. macdougallii as conspecific and chemical analysis of the lactaceous juices of all three show no variation while other milky juice Mammillarias do show a difference in chemical characters.

Another factor for determination has been the chromosome counts of species but Dr. Poindexter of Occidental College has called to my attention that "previous investigators have shown that in the Platyopuntia group the chromosome number seems to vary with geographic races." Dr. Poindexter is now conducting similar experiments with annotated specimens of geographic variations within a species in the Cylindropuntia group from material supplied by us.

A classic example of geographic variation was afforded when an expedition from our Garden collected at 5 stations in the White Mountains and in 2 other mountain ranges at 5000 to 6000 feet altitude a small, globose, strongly tubercled plant suggestive of a Mammillaria and almost exactly checking with a Navajoa peeblesiana

Croizat.

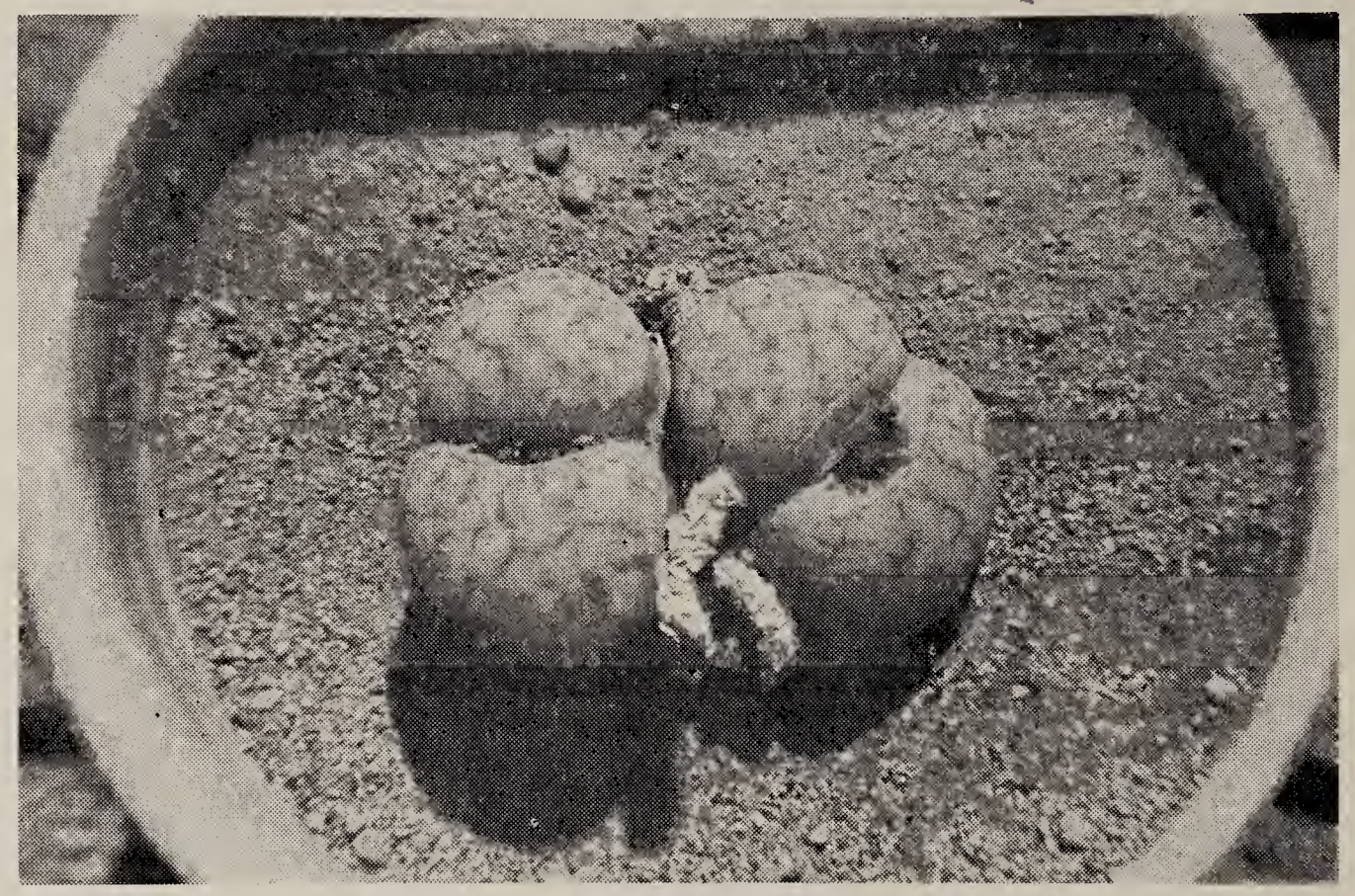
The tubercles bore four flat spines in cruciform arrangement and we at first though we had at last found the completely lost Navajoa.

Unfortunately we found a few plants in flower and it was a flower typical of the genus Echinocereus. No fruit was seen so we delayed publication of our new species till we had flowers again to photograph and for possible fruit.

After four years in our Garden our new Echinocereus has degenerated into E. fendleri var. bonkerae.

The plants now are 5 to 6 inches high, the lower 2 inches just as we collected them but all new growth ribbed and bearing the short, almost pectinate spines of variety bonkerae and stranger still the small 1½ inch flower borne by the plants when collected are now 3-inch flowers typical of E. fendleri.

Next month we will discuss flower color variation and the great variation observed in stigma color on some species.



4. Lithops pseudotruncatella

CONVENTION VISITORS

The Convention of the Cactus and Succulent Society at Arcadia, California in July was a success judging by the glowing accounts of most of the delegates who stopped over at our Garden on their way home.

Unfortunately they reached Phoenix at the peak of the summer heat. Mr. and Mrs. John Haag of St. Paul found it much too hot to linger so we had only enough time to hear about the Haag collection which is housed in a large glass house which is open to the public. Many visitors get their first view of desert plants at the Conservatory, as Mr. Haag calls his place, and he has done much to spread knowledge of our favorite vegetation.

Mr. and Mrs. Laval Goulet and two sisters of Mr. Goulet spent a few days with us and as this was their first visit to the desert they were intensely interested. Mr. Goulet has a very extensive collection at Amos, Quebec where the plants must be kept in glass houses and heat must be supplied all winter and even on some nights in the summer.

On a trip to the MacDowell Moun-

Opuntia polyacantha — Staff photo

tains with Jim Blakley, Laval actually collected specimens from their native habitat and studied the conditions under which they grow.

His collection is nearest to the North Pole known to us and is the collection grown under the most adverse conditions but still is a large and thriving group of plants as his photographs clearly indicate.

Charles and Mildred Cole of Cincinnati paid us an all too brief visit and reported on the condition of the large succulent plant collection housed in an immense glass house in the Irwin Krohn Conservatory in Eden Park.

Slim Moortens and his wife and son stopped overnight enroute to old Mexico on their fifth trip into the cactus regions. They travel in a truck equipped for housekeeping but light enough to get over rough roads. They plan to be gone six weeks or more and will go down the west coast of Mexico to the Isthmus.

On earlier trips Slim has found a number of new and interesting plants and I am sure that this trip will prove no exception.

Enroute to the Convention Sister Maire Fidelis I.H.M. from Monroe, Michigan spent four or five days in Phoenix and found time to spend the better part of two days in our Garden.

Sister Fidelis was doing post graduate work in botany at the University of Michigan when I first met her two years ago. Her explanation of the action and history of chromosomes held the Denver Convention of the Cactus Society in wrapt attention for a longer period than I could hope to interest any audience even with the aid of vivid Kodachromes.

Sister Fidelis thought that it would be ideal for her work and the work of other students of desert plants could they but have a collection like ours, grown under natural conditions, to work with.

Our Garden is always available to students and especially during the Summer when we are closed to the public and we have long range plans for summer classes.

Mr. and Mrs. Frank Mark of Tucson were also recent visitors. Frank has been interested in desert plants for about 14 years to my knowledge and at one time had the outstanding collection of crests. He went into the Botanical Book business in Los Angeles and 4 years ago moved his business to Tucson.

He is now closing out the book business and is again becoming a plant collector. He brought us a number of fine plants and presented the Garden with an 89 volume set of the Smithsonian Reports, an item we have always needed but could not afford.

Mert and Mort Spieman of Chicago, Mrs. William Rutschmann of Denver, Arthur Garrabrunt and family from Cedar Grove, N. J., and Mr. and Mrs.

John Bock of Sharon, Pa., also visited the Garden.

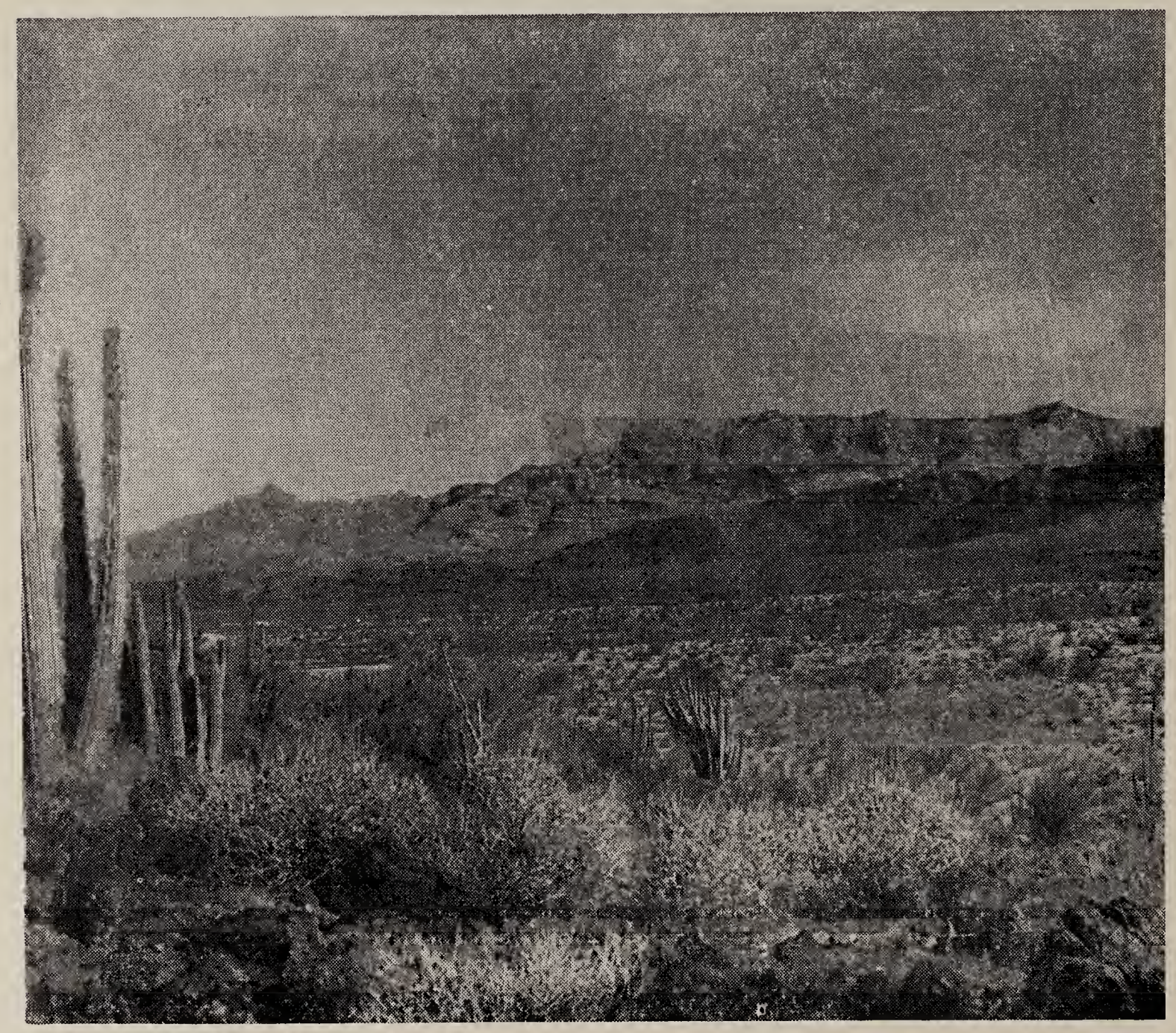
We are now expecting Prof. and Mrs. Arthur Blocher of Amboy, Ill., who have grown a large number of seedlings for us, many of which are now planted out in the grounds.

Desert Botanical Garden
Papago Park, Arizona
Gentlemen:

I have read in a Philadelphia paper about your wonderful herbarium.

Please send me a price list of your herbs.

Sincerely,



A valley in Organ Pipe Cactus National Monument
Wm. Supernaugh photo

Two views of habitat plantings in the Garden
Photo by J. Fleming.

Desert Botanical Garden

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SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

OCTOBER, 1953

First Fall Meeting Of

CACTOMANIACS

in

Webster Auditorium

DESERT BOTANICAL GARDEN

Tuesday, October 6th

AT 8:30 P. M.

All Members and Their Friends
Are Invited

YOU WILL ENJOY THIS MEETING

SAGUAROLAND BULLETIN

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W. TAYLOR MARSHALL, Editor

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Volume 7 October, 1953 No. 8

Table of Contents

Editorial 87
International Organisation 88
Coloradoa Mesae-Verdae 89
Grand Canyon 92
"What Kinda Cactus Izzat?" 95

Desert Botanical Garden of Arizona

Staff

Director .....W. Taylor Marshall
Superintendent .....W. Hubert Earle
Curator of Herbarium .....E. R. (Jim) Blakley

Garden open every day, except Monday, from 10 A.M. to 5 P.M.
No charge for admission.

EDITORIAL

The winter season will officially open on Saturday, Oct. 10th when we will commence to open the Garden daily, except Mondays, from 10 A.M. to 5 P.M.

We will not have lectures on Sunday afternoons this season as we have in the past but will have illustrated lectures on Thursday afternoons at 3:30 P.M. commencing in mid-November.

We have made this change for several reasons. First, we attract very large crowds on Sundays and every man on our staff is needed in the Garden and if we have lectures on that day one man has to give the talk and another is needed on the terrace to issue camera permits and supply Nature Walks.

Second:—Only a small proportion of our visitors can get into our rather small Auditorium (about 125) while at least 500 other visitors must be refused entrance because of lack of seating room.

Third:—Our mid-week attendance is much smaller than the week-end attendance and we feel we can increase the Thursday afternoon attendance by giving our lectures on that day.

Classes for adults interested in knowing more about desert plants which were formerly conducted on Thursday will now be held on Wednesday afternoons at 3:30 commencing later in the season.

We present in this issue the photograph that was omitted from the Aug.-Sept. issue where it was scheduled as photo No. 5 to illustrate the article on Mimicry Mesembs. It shows a pot of baby-toes, Fenestraria rophalophylla.

The Detroit Cactus and Succulent Society celebrated the tenth anniversary of its organization on Sunday, September 13th at the Detroit Garden Center. Our congratulations and best wishes go to this live Cactus Club.

With deep regret we report the death of Fred Gibson who has been the executive head of the Boyce-Thompson Southwestern Arboretum at Superior, Arizona. It occurred at his home at the Arboretum in August.

Baby toes — Fenestraria rophalophylla. This picture was omitted from last month's Bulletin. Staff photo.

Mr. Gibson, who was also on the Advisory Board of the Desert Botanical Garden, was well known and liked by cactophiles as well as plant scientists for his willingness to share his plant knowledge and experience with amateur and professional equally.

INTERNATIONAL ORGANISATION

Since the publication of our first article on the International Organisation for Succulent Plant Study last month we have received a letter from Mr. H. M. Roan of the English Cactus Society which defines the aims of the International Organisation so fully that we quote from his letter:—

"Far from ever wanting to limit or regiment individual research — in any phase of plant study — or wanting to dictate what should be accepted as correct or discarded as obsolete — it is the object of our Organsation to facilitate individual study and making it more valuable by opening up avenues of exploration and means of "check-back" which are not normally available to everyone.

I think we are all agreed that field work is required to supplement laboratory or desk work (describe it how you will as cytology, micrography, dissection, taxonomy, or any other aspect of it) and laboratory or desk work is required to supplement field work. In addition, I feel sure you will agree, that the most experienced and conscientious observer can, and often does, miss something which another worker on the same subject, often even a comparative newcomer, sees and observes— perhaps just because he is looking at whatever it is from another angle. Finally there are many publications, either of text or of illustrative matter, or herbarium material, which is somewhat inaccessible and rare. In every case our cause can be fostered by certain people being put in touch with each other or with certain Bodies who would not necessarily and normally have knowledge of each other or the right means of introduction.

I am pleased to say that has already happened in a number of cases much to the benefit of our cause.

As you also know the literature of our subject is very much scattered about and there is still a great deal of continuing variation in the method of description and the amount of information provided in connection with new descriptions. Here again, by a co-operative international effort it should be possible to establish a central register, such as is our "Repertorium," to enable researchers to at least ascertain where the necessary information can be found. It is not our intention to direct where these new findings should be published although we hope, through co-operative voluntary effort, to at least induce some workers to avoid completely out-of-the-way journals or, if they will not do this, to advise us on their own accord where they have published their latest findings and supply us with two or three reprints for the use of members.

Much more can be, and is being, achieved along these lines and other similar lines and I am sure much good can and will come of people with strongly divergent views on the same subject being able to meet in Congress or as fellow members of the I.O.S. outside Congress and, in a suitable detached scientific atmosphere discuss or lay before their fellow members their respective theories and ultimately either find agreement or agree to differ on certain aspects subject to more information being available."

In our first article we proposed to discuss something of flower color and stigma color variation in some species of Arizona cactuses.

Flower color has, in the past, been given an importance that is certainly undeserved. For example Britton and Rose have used flower color as the principal factor in their keys to the species of the genus Echinocereus.

Echiocereus fendleri and E. engelmannii are both included in their sec-

tion of purple flowered species yet E. engelmannii in much of its Arizona range bears a rose-pink flower or occasionally one that is almost white.

E. fendleri in most of its range has a deep magenta flower but this species also varies and rose-pink flowers are not unusual. At one station near Magdalena, Sonora I found a large colony of E. fendleri with white flowers.

Opuntia erinacea and most of its variations show extreme variations in flower color, some colonies having rose colored flowers while others are lemon-yellow to golden-yellow.

In southern Utah we found one colony of Opuntia phaeacantha in which the individuals on the west side of the highway all had yellow flowers while those on the east side, about 60 feet away, all had light purple flowers.

Stigma lobe color is at times also variable. Mammillaria microcarpa has been collected by us with bright red, yellow and greenish stigmas on different individuals.

The instance of color change from year to year on one individual has been frequently recorded by us. For example several specimens of E. fendleri which bore deep magenta flowers one year were noted to have light rose-pink flowers the following year.

We have quoted before, the case of the numerous specimens of Mammallaria viridiflora collected on the Globe-Superior Highway at the type locality of that species and all bearing greenish-yellow flowers.

Nearly all of them had bright magenta flowers after one year in our Garden and were then obviously M. wrightii.

We could quote numerous other instances of color inconstancy but these are sufficient to demonstrate the point we wish to make which is that only a field worker or desk worker who has access to complete field notes can possibly have the necessary information to determine new species or even to make positive identification of species.

COLORADOA MESAE-VERDAE

CHAS. MIEG

After several years of failure I finally found this much sought for cactus on our vacation last August. Long hikes along the Southern and Western base of the Mesa Verde Cliffs had produced no results and a final try at a location quite removed from the Mesa proved the correct guess.

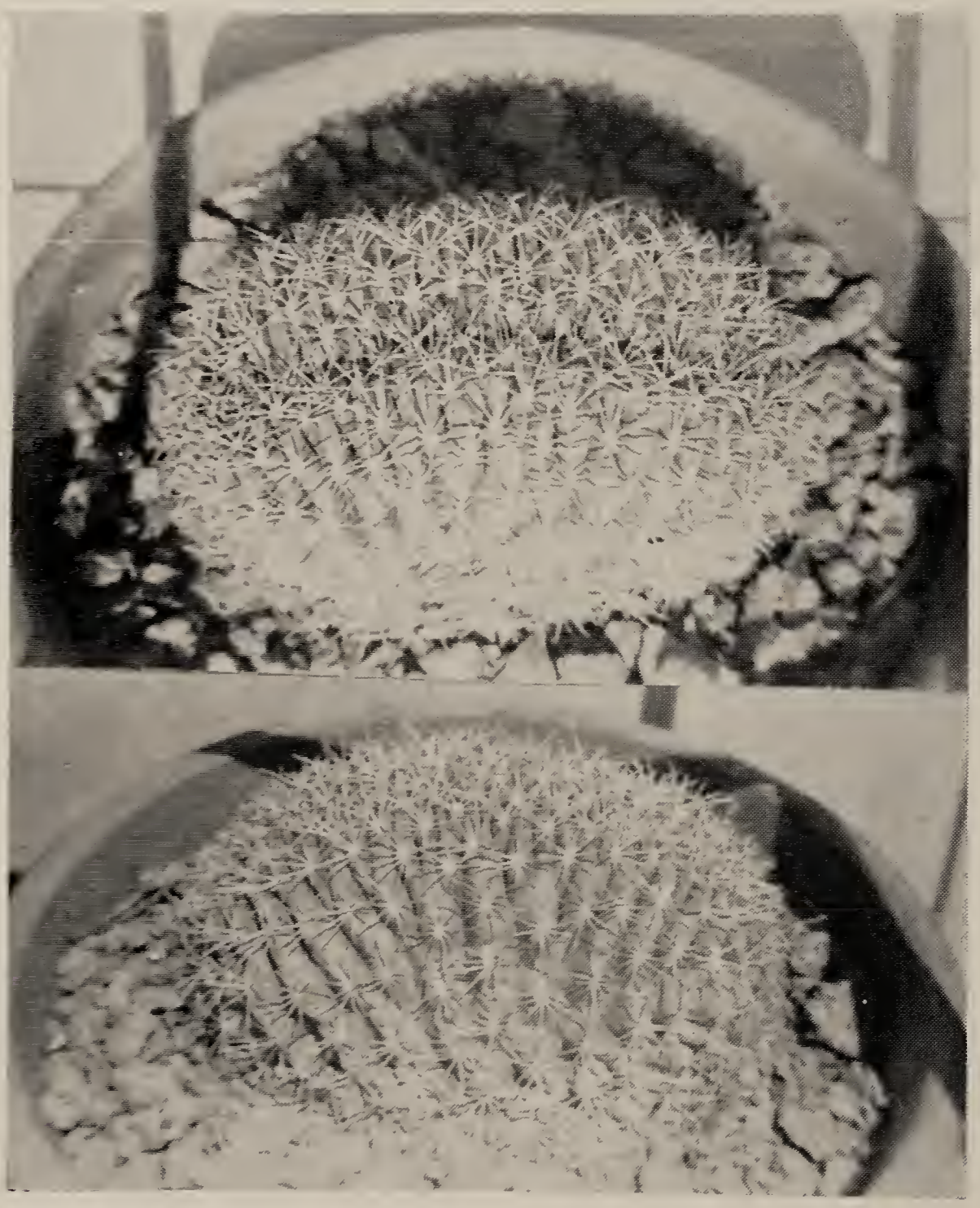
With my family we were bouncing along at a reckless speed of 5 miles per hour across roadless desert when my wife announced that we had gone as far as the car should go and her order proved right as at the precise moment I spotted the first Coloradoa less than 20 feet in front of the car. We hopped out and began to spread out, and in a few minutes we found 42 more plants all within 300 feet of the car. Since information was of greater importance than the acquisition of plants I began to take notes.

The first fact which stood out was that Coloradoa grows in a quite distinct type of soil which consisted of a decomposed rock formation which is not part of the Mesa Verde Cliffs. This soil is exceptionally poor and with the naked eye no traces of humus could be detected. Consequently there was practically no other vegetation present and that usually less than 3 inches tall. Grasses were nonexistent and a platyopuntia which I did not identify was the only other cactus found in the same location.

After the first discovery I confined my further prospecting to areas where the same soil conditions were present. This proved a lucky guess again and before the day was over we had located our cactus over an area of 2 by 10 miles and in substantial stands. Quite a few Sclerocactus whipplei and E. triglochidiatus (var. octacanthus) were also found but these never grew together with the Coloradoa. At first I started to count the plants we found but after

reaching 163 we decided that Coloradoa is not as rare as it was supposed to be and merely continued our observations as to this plants habits. Of the first 163 all but 2 were growing completely unprotected and in the open, they were therefore easy to recognize from as much as 75 feet distance. Only 2 plants were found to grow in the protection of other vegetation. The plants were present equally on all sides of the various hills but were not found in the flat lands where drainage was poor even though the soil was right. The soil appeared to consists of Alumina and lime but only an analysis will show if this surmise is correct. Soil for this purpose was taken along. As mentioned before no humus seemed present but there was some evidence of coal seams. Fossils also were found in this same formation. Coloradoa was found and described by Dr. Boissevain and I have nothing to add to his description. The range of the plant extends into New Mexico but on our trip we were not able to confirm if it also extends into Arizona. This will have to wait for cooler weather.

Coloradoa is often found in clusters but these clusters are not a natural characteristic of the plant. Often they are individuals growing together from several seeds or they are the result of damaged stems which then will branch.



Top view (above) and side view (below) of Crested plant of Coloradoa mesae-verdae. Staff photo.

Evidence of bug damage was found and occasionally larvae will eat out the inside pulp, causing the plant to rot.

A map was prepared and accurate information as to location has been prepared and this information has been deposited in the Herbarium of the Desert Botanical Garden of Arizona.

For obvious reasons I am not very specific here as to the accurate location of these plants. Occasionally a cactomaniac will degenerate into a cactus hog and we had several instances lately when whole populations of scarce plants have been plundered by socalled collectors from Arizona as well as California. Utahia silerii and Toumeya papyracantha have suffered heavily from these hogs as well as Coloradoa of which latter species over 100 were brought back last year by some of our local vandals. Some of these plants are offered for sale or trade, but the majority is usually left to rot. The main object seems to be solely to make sure that nobody else should get one.

Nine plants were brought back. The choice specimens are now in the Desert Botanical Garden and include the only perfect crested specimen which we found, and a plant for the Herbarium; the five remaining plants were divided among Herbert Bool, R. C. Proctor, John Hales, C. C. Pidgeon and Carroll Mills, all of whom have always been most generous with their own plants.

With the myth of rarity finally exploded, we hope that Coloradoa will be of less interest to the Cactus hog and have a chance to survive for the enjoyment of others.

As for myself, I kept none of these plants. After the thrill of discovery possession would be only anticlimax.

Coloradoa Mesae-Verdae Boisserain. Photo by George Olin.

GRAND CANYON NATIONAL PARK

By
JAMES A. McCLEARY*

Pinyon pine and juniper forest east of Desert View Watchtower, South Rim. Grand Canyon National Park Photo.

The following story is told by one of the ranger-naturalists at the Grand Canyon National Park. A car drove up to the parking lot at Yavapai Observation Point and two men climbed out. Walking over to the rim, they stood and looked down into the canyon, seemingly overawed by the miracle which they were viewing. Finally, after about five minutes of gazing, one of the men turned to the other and said, "You would think that they would make something out of this place."

Everyone who visits Grand Canyon National Park is impressed in some manner. There are those who receive spiritual benefits; others who are overwhelmed by the majesty and breathtaking beauty of the sight before them; many are impressed in other ways. Perhaps the story which best illustrates this is the one concerning a minister and his son who visited the canyon. The minister, like most ministers on a vacation, still felt obligated to his parishoners and decided to write them a letter suggesting ways in which they could spend their vacation without recourse to bars, night clubbing, etc. In this letter he discussed the manner in which the colors of the canyon change, minute to minute, hour to hour and from day to day. He told of the spiritual values which could be obtained from observing this, one of the greatest

*Assoc. Prof. of Botany, Arizona State College at Tempe and seasonal ranger-naturalist Grand Canyon National Park

of the Master's handiworks. He ended the letter something like this: "If there is a God, and there certainly must be one, you can see his handiwork in Grand Canyon." The son visiting with his father, was also interested in the canyon. He listened to the lecture at the observation station and heard the ranger say that the canyon is over a mile in depth. After the talk was over he approached the ranger and said:

"How deep did you say the canyon is, ranger?"

"One mile."

"Are you sure?"

"Yes."

The boy went away satisfied and that night he sat down and penned a note to a friend of his. He wrote, "I've had a wonderful experience today. I want out to Yavapai Observation Station, stood on the parapet, and today, — I spit — a mile."

The Grand Canyon National Park is one of 28 parks throughout the United States and its Territories. It is located in the northwestern corner of Arizona. No part of it is in Colorado as so many people believe. The park itself consists of 1009 square miles of territory and as large as it is, it does not include all of Grand Canyon. The canyon is 217 miles long, 105 of which are included within the National Park. The canyon is 18 miles wide at the eastern end, 4 miles wide at the western end and approximately 10 miles wide at Grand Canyon village.

The canyon may be reached by means of the Sante Fe railroad, by means of the Navi-Hopi tours out of Flagstaff or by car over highway 64 branching off highways 66 and 89. The south rim of the Park is open the entire year round but the north rim is only open during the summer months, due to the excessive amount of snow which falls during the winter.

The story of Grand Canyon is the story of life through the ages. Here can be found fossils extending in time from the Proterozoic up to the present. Standing on the south rim of the canyon it is possible to see, from one spot, all the chapters of earths history. Geologists divide earths story into five different eras. These are the Archeazoic, Proterozoic, Paleozoic, Mesozoic, and Cenozoic. In each of these, with the exception of the Archeazoic, evidences of life may be found. Different formations of rock layers are encountered and information accumulated in the walls of the Canyon itself, that seven different times seas covered the region. The Coconino sandstone layer of some 350 ft. in thickness, is the result of sand dunes which once covered much of the southwest during a period of time when the area was very arid and a Sahara like desert was formed. Of course, study of Grand Canyon does not tell the history of the formation of the earth's crust the world over. There are certain paragraphs of some of the chapters to be found other places which cannot be found in the Grand Canyon. However, this entire story can be heard out at the Yavapai Observation Station four times daily during the summer. Attendance there should rank number one for any visitor.

Another impressive story which can be read at this natural wonder of the world is the canyon as a barrier. Not so much a physical barrier, although that, too, has had some effect. If, during the summer months, you were to make a mule or hiking trip to Phantom Ranch in the bottom, you would find that the temperature there is that of desert regions. Maximums may reach as high as 120 plus and seldom go as low as 32 degrees Fahrenheit in the winter. The plants and animals found are such as the mesquite and catclaw, the pink rattlesnake (the only place known for this subspecies), the chuckawalla lizard and many others. Climatically, the inner canyon is similar to northern Mexico. Come up to the south rim of the canyon, which is approximately one mile higher. Here the climate is like that of much of the United States, at least in its southern portion. Pinyon pines and junipers are the dominant plants, with many shrubs such as cliffrose and apache plume abundant.

View of Canyon from Shoshone Point.
Grand Canyon National Park Photo.

Many animals can be found including the deer, rabbits, squirrels, chipmunks, etc. Precipitation on the south rim averages 21 inches as compared with 7-10 in the bottom. 10 inches of this 21 inches comes in the form of 100 inches of snow. (A general rule of the thumb here is that 10 inches of snow equals 1 inch of rain.) Temperatures range between -20 up to 98 degrees.

Across the canyon, 10 miles away and 1200 ft. higher, the situation is entirely different. Climatically one is now in southern Canada. Here the precipitation may reach 40 inches in places. So much snow falls in the winter that most years the facilities on the north rim are open only 3 months out of the year. Dominant plants include the Ponderosa, the firs, spruces, aspens and the bigtooth maple. Large mammals are particularly abundant. One report came from a tourist who had made the 44 mile drive from Grand Canyon lodge on the north rim up to Jacobs Lake. During this short trip, 486 deer and antelope were counted feeding in the open meadows through which the main highway cuts. An especial treat to anyone, visitor or employee alike, is to see the famous Kaibab or white tailed squirrel which is found nowhere else in

the world.

Oft times the ranger-naturalist on duty in the park is approached by a visitor with the following: "Say, what causes all of this ,anyway? I come from Ohio (or Missouri, or Mississippi) where we have a river which is certainly much larger than that little stream way down there. Why doesn't our river cut a canyon?"

In explaining the canyon there are usually three general reasons given for the canyon being cut. Two of the reasons deal with the depth of the canyon, the other deals with the width. The depth is caused by the river itself cutting its way down through the rock layers and also by the fact that the land in this region is slowly rising. The Colorado river is much larger than it appears from the rim. Standing at one of the observation points, the river is approximately three air miles away, so that which appears small is actually very different. At places the river may be over 400 feet in width and 45 feet deep. It is very swift also, moving at a rate of speed up to 12 miles per hour. Of course it is faster in the rapids. As the river moves on, it carries with it millions of tons of silt, sand, gravel and even large boulers. These act as abrasive materials gouging away the sides and bottom of the innergorge just as an industrial sand blast machine will clean metal or the outside of buildings. The second reason for the depth of the canyon deals with the uplift of the land. Space does not permit a complete explanation of this point. Suffice it to say that as the land moves upward slowly, the river continues to cause the cutting of the rock. The width of the canyon is due to other erosive factors. Factors such as the terrific downpours of rain which occur with some regularity during the summer months. It is estimated that, due to the sparsity of plant cover to protect the soil, as much soil is removed from the sides of the canyon during a two hour rain as would be removed from a comparable area back in Michigan, New York, etc., where the soil had protection from the beating force of the rainfall in an entire year. Freezing of water, causing fragments of rock to break off as well as the entrance of roots into cracks, their enlargement and the splitting off of chunks, play their part in the entire process. A visitor to Grand Canyon one million years ago may have seen a canyon only five miles in width. A visitor one million years from now may see a canyon twice its present distance across.

When planning a trip to the Grand Canyon, spring or late summer is usually without much rainfall. At that time the days are warm and the nights cool. There are many things to do and see. One day is not long enough to even begin. A word of caution is in order, also. If you plan to spend the night at one of the Fred Harvey enterprises, be sure to make reservations before you go. Last year there were over 700,000 visitors to the park. This year, in the month of July, there were approximately 170,000 persons who entered through the checking stations.

GOOD NEWS

At last the new edition of the very popular "What Kinda Cactus Izzat?" by Reg. Manning is ready.

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Desert Botanical Garden

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1 pound box	1.60	.30
Prickly Pear Jelly— 4-12 oz glasses in shipping carton. A clear red jelly of exceptional flavor	2.35	1.00

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SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

NOVEMBER, 1953

Testudinaria elephantipes

REG MANNING

SAGUAROLAND BULLETIN

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W. TAYLOR MARSHALL, Editor

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Volume 7 November, 1953 No. 9

Table of Contents

Editorial 99
Elephant's Foot 100
Copiapoas From Chile 101
Two Lost Plants Again Collected 101
Echinocereus Fendleri Variety 104
Arizona's Cactuses, Second Edition 105

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Garden open every day, except Monday, from 10 A.M. to 5 P.M.
No charge for admission.

EDITORIAL

We are now into the full sway of the winter season and the Garden is open daily (except Monday) from 10 A. M. to 5 P. M. The Sunday lectures of past years will be discontinued as explained last month.

The Thursday lectures to replace the former Sunday talks will commence Thursday, November 19th, at 3:30 P. M. and will be continued each Thursday thereafter.

The class in "Appreciation of Desert Plants" will commence on Wednesday, November 18th, and continue for 5 weeks. It is open to anyone without charge and a Certificate will be given to all who attend the complete series of talks.

We will discuss desert plants as ornamentals and cover the methods of growing them and teach the identifying factors of the most noticable plants.

We will also resume our Monday evening class in the Taxonomy of desert plants if we have enough interested prospective students. There is no charge for this series of lessons so let us know if you would be interested.

Last spring we had a visit from a nice couple from New England who were collecting lots of cactuses and wild flowers as well as mountains and valleys in a stereo camera. The following paragraph from a letter just received from them (they are members) is worth quoting we think:—

"Apropos of Mr. Meig's article, my friends all say "did you bring back any cactuses" and I have to explain that, due to my "sentimental" make up, the only ones I have are 2 species of cholla (the jumping kind) which affixed themselves to my inquiring fingers and which, just for that, I dumped into a paper bag along with my galoshes, but which I set in pots on my return to flourish in my sunny bay window as a reminder.

"I am very happy to think that all of the rest are still growing happily in situ and stereo — not in a pot — I hope they are still at home when or if we can ever return to see them."

A little more of this spirit of conservation and the problem of disappearing species would soon correct itself.

Howard Gates, a member and well known to our readers as a plant explorer and the judge of last year's Cactus Show, was injured in an auto accident near Baltimore, Md., and is currently in a hospital with a broken knee cap.

We deeply regret to announce the death of our good member and friend Joseph Birchett at his home at Tempe. Mrs. Birchett is also well known to all western bird lovers.

International Organization

At the second Congress at Monte Carlo in July four Americans were elected to membership in the International Organization for Succulent Plant Study. Membership is by invitation only and it is nice to know that there will be American representation. Dr. Yale Dawson, Allen Hancock Foundation, University of Southern California, Howard E. Gates, Corona, Calif., Paul C. Hutchison, Botanical Garden, University of California and the writer comprise our representation but Mr. Reid Moran, whose acceptance arrived too late for action at the Monte Carlo Congress will be proposed for temporary membership subject to confirmation by the next Congress which will be held in London in 1955.

A meeting of the American members should be held as soon as possible and we have great pleasure in extending to the other members an invitation to meet at the Desert Botanical Garden at a time mutually agreeable to them.

Desert Christmas Gifts

One way to assist the Desert Botanical Garden financially without donating money is to purchase your Christmas Cards and Christmas Gifts from our Book Store, in person if possible, otherwise by mail.

One new item which should make a wonderful gift is a Kachina. These

dolls are made of drift wood, always cottonwood root which has been water-logged and sun dried. They are carved by hand and hand colored with tempera paints and are each an accurate reproduction of Hopi Indian Gods and made by a Hopi-Abbott Sakiestewa. We have many different Kachinas in each price range.

Prickly Pear Jelly and Prickly Pear Delight are other desirable gifts or a box of cactus plants for home growth makes a very acceptable present.

We have also a wide range in books on Succulent Plants. See the back cover for listing and prices.

FRONT COVER

THE ELEPHANT'S FOOT

For a great many years we have been trying to secure a plant of Testudinaria elephantipes from South Africa but it is only this summer that we realized our ambition due to the kindness of Paul Hutchison of the University of California Botanical Garden.

Not only have the plants been very scarce but even literature on them has been lacking, therefore we were amazed to find the species written up in two separate magazines just after we had the plate made for us in this issue of the Bulletin.

An article by Mr. Gordon Rowley in the September issue of The National Cactus and Succulent Journal of Great Britain has three beautiful illustrations from photographs by Dr. E. Elkan and three plates of line drawings describing the five species and three varieties in the genus Testudinaria.

Testudinaria as a generic name is rejected by many general botanists who lump the species in the genus Dioscorea which includes the Yams as our plant is a member of the sweet potato family.

Our illustration is of a fairly young seedling which may be expected to attain to a height of 4 feet within a century. The woody caudex is entirely above ground having a perfectly flat base from which the few fiberous roots go into the ground.

During the short growing season, which is in September and October in South Africa but in summer in Arizona, the tuber sends up a vine which twines into adjoining vegetation to leaf, flower and fruit and then dry up.

Natural History Magazine for September contains an interesting report by Walter Hendricks Hodge illustrated by 7 photographs of plants in nature taken by the author who was commissioned by American scientists to collect several hundred pounds of the tubers to be tested as a source or cortisone.

Inquiring from reliable sources he was informed that the plant was so rare that it was very highly protected by law. After he had secured permission to collect them for scientific purposes he organized a systematic search in the very remote regions from which they had been first reported and located several very large colonies of the plant. Plants collected by him and sent to the United States proved to be a poor source of cortisone so there is little danger of extinction of the species.

The caudex or above ground tuber has the consistency of a turnip and is covered with a corky bark in roughly 5 sided plates to resemble the shell of a tortoise, therefore the name Testudinaria meaning "like a tortoise."

Elephontipes, meaning elephant's foot, has reference to the appearance of mature plants and the name is apt.

Seeds germinate readily, if you can get them, and thereafter it is only necessary to keep the plant dry except in the short growing season and in something less than 100 years you will have a plant of which to be proud.

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COPIAPOAS FROM CHILE

The genus Copiapoa was erected by Britton & Rose in 1922 to include 6 species of globular cactuses all native to the coastal region of northern Chile. The name of the genus is derived from the province of Copiapo.

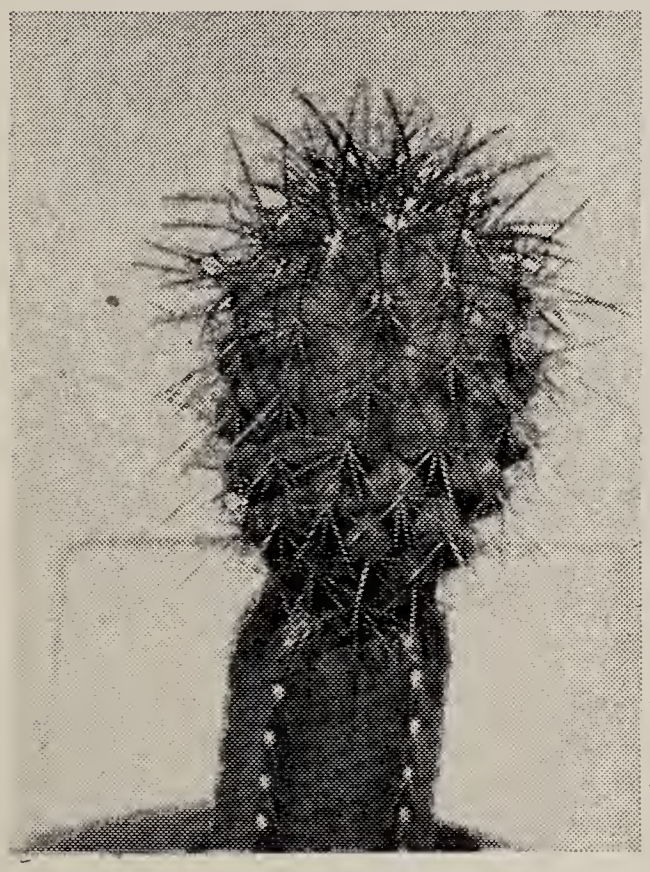
Not too much has been known of the Copiapoas in the United States and only one species has been in cultivation to any extent.

Britton and Rose concluded that 14 species described as Echinocacti by previous authors included only 6 distinct plants but Dr. Rose who collected in Chile in 1914 obtained only 3 of the species.

Backeberg later collected in the same territory and with his usual tendency to split on minor characters proposed a number of additional species.

The recent collecting trip by Paul Hutchison under the auspices of the University of California has resulted in the collection of a large amount of material for study and we may look for some very informative articles on the Copiapoas from him in the future.

Copiapoa humilis (Philippi) B. & R.
Staff photo.



Copiapoa species
Staff photo.

The two species illustrated herewith were donated to the Garden by Mr. Hutchison and the University of California and this gift increases our collection to 4 species.

All of the species are interesting because of the body coloration and the dense soft wool which covers the top of the plants and nearly hides the bell or funnel shaped, yellow flowers.

When Dr. Boissevain wrote Colorado Cacti in 1940 he proposed to put the plant which he later named Coloradoa mesae-verdae into the genus Copiapoa based on his study of herbarium material in the New York Botanical Garden and collected by Dr. Rose. There is a superficial resemblance between the two genera but they are certainly distinct in many ways.

TWO LOST PLANTS AGAIN COLLECTED

Perhaps no one in Arizona has contributed more to our understanding of little known species than J. Whitman Evans.

In 1940 he found the long lost Cereus diguettii Weber on the Sonora-Arizona line and supplied the writer with material which showed the peculiar root

structure and the nocturnal funnelform flowers on which he based the erection of the genus Neoevansia.

In October of 1948 Mr. Evans made a trip into the State of Chihuahua, Mexico, and relocated many species of Cactuses that were not in cultivation in this country including Echinocactus parryi, Thelocactus pottsii, Escobaria chihuahuensis, Coryphantha salmdyck-iana, Echinocereus palmeri and E. standleyi.

The last two species of Echinocereus will be discussed in an article in a later issue but today we want to comment on the first two species in the list.

Echinocactus parryi Engelmann
A plant collected near Lake Guzman, Chihuahua, by J. Whitman Evans.
Staff photo.

Echinocactus parryi was described by Dr. George Engelmann in Cactaceae of the Boundary Report but due to delays in having engravings made the Report was not published until 1859 and Dr. Engelmann had meanwhile made a separate publication in the Proceedings of the American Academy of Arts and Sciences in 1856.

The plants on which the species is based were found by Dr. Parry in the "Desert region southwest of El Paso toward Lake Guzman" and Dr. Engelmann's description was based on Dr. Parry's notes and from a few spine clusters sent to him by Dr. Parry and is as follows:

"The plant is 8 to 12 inches high by 10 to 15 inches in diameter, always simple; the ribs interrupted; upper tubercles less distinct, flattened sidewise, lower older ones transverse and very distinct; grooves between the ribs about an inch deep; areolae of the spines ½ inch in diameter, orbicular, or with closely adjoining floriferous areole oval, about ¾ inch long. Radial spines (in my specimen) 8 or 9, "often as many as 11;" lower ones divergent, stoutest, upper ones more slender; central spines 4, stouter and 1½-2 inches long, somewhat bulbose at the base; upper and lower one, especially the last stoutest and longest."

Flowers and fruit are not reported.

In both the Cactaceae of the Boundary and Proceedings of the Amer. Acad. Echinocactus parryi immediately followed E. polycephalus and in both the following comment was made:

"Very similar to the last (species) but apparently distinct by the manner

of growth and the white spines."

The specimen illustrated was collected near Lake Guzman by Mr. Evans and its close relationship to E. polycephalus is noticeable. It is, however, always a simple plant while E. polycephalus, as the name indicates, usually clusters to form large mounds.

The flower is clear yellow and much larger than that of E. polycephalus. The fruit is densely covered with a gray to white wool.

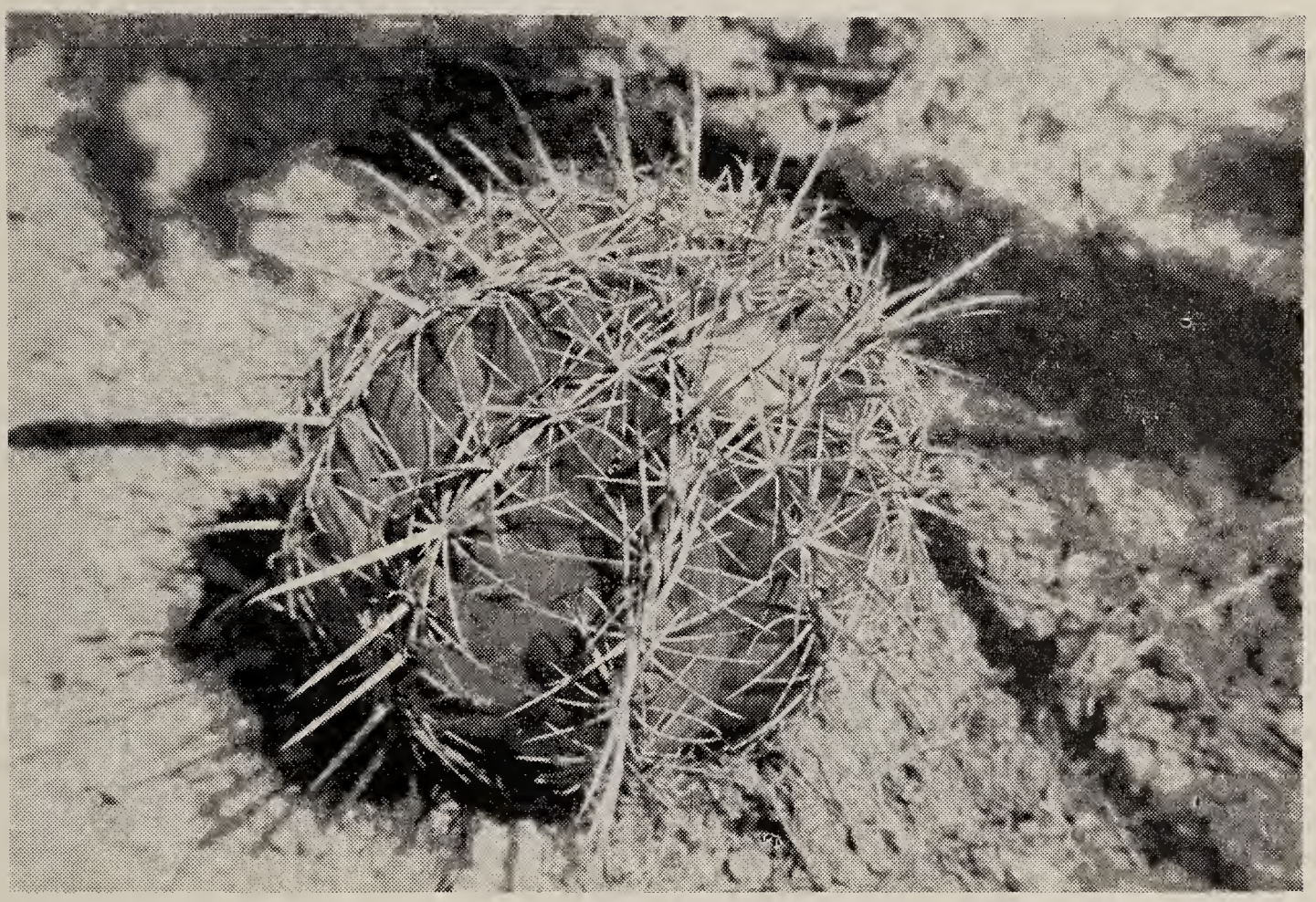
In the plates illustrating the text in the Boundary Report, plate 32 illustrates the spine clusters, a complete plant and the seeds of Echinocactus horizonthalonius and 2 spine clusters of E. parryi.

Possibly because of this association of the two species on one plate Britton and Rose in Cactaceae III; 175, 1922 reduced E. parryi to synonymy under E. horizonthalonius. Had they read the descriptions of the two plants such a conclusion would not be possible, as E. parryi has acute, narrow ribs, is yellow-green in color and has yellow flowers while E. horizonthalonius has obtuse, broad ribs, is blue-green in color and has rose-pink flowers.

E. parryi grows beautifully in our Arizona sun but might be somewhat more difficult in a more humid climate. It is a good looking plant which produces its relatively large flowers freely.

Thelocactus pottsii (Salm Dyck) B. & R. is one of the most attractive of the Thelocacti and bears some slight resemblance to some very red spined forms of Thelocactus bicolor, a species to which Salm Dyck once assigned it as a variety.

The only plant the writer had ever seen of this beautiful species was one in the collection of James Manson of Nogales who had collected the plant near Chihuahua City.



Thelocactus pottsii (Salm Dyck) B. & R.
A plant collected near Chihuahua City by J. Whitman Evans. Staff photo.

In 1939 I saw the plant in Mr. Manson's collection and so greatly admired it that Mr. Manson sent the plants to me in Los Angeles a week later, as he planned to make additional collections on his next visit to Chihuahua, an ambition that he failed to realize.

My plant met the same fate in my

Los Angeles garden as is usual in the humid coast climate with arid desert plants and after lingering painfully for three years it died without flowering.

The plant illustrated is one of several given to the Garden by Mr. Evans and collected by him near Chihuahua City.

Our plants are all thriving and produce their large rose-magenta flowers continuously throughout the spring and summer months.

For the introduction of these two very worth while plants we are indebted to Mr. Evans as well as for the introduction of two very fine Echinocerei which we will discuss in a later issue of the Bulletin.

Echinocereus fendleri var. boyce-thompsonii
Lex Fuaux photo

ECHINOCEREUS FENDLERI VARIETY

The photo by Lex Fuaux of Australia of a variety of Echinocereus fendleri probably belongs to the variety boyce-thompsonii although this variety so closely approaches variety robustus as to make identification from photographs very difficult.

We have suggested in Arizona's Cactuses that it is almost unnecessary to retain both varietal names when one would cover both and as the boyce-thompsonii name is of earlier publication it should possibly be retained and var. robustus abandoned.

We would like to have comments on this possible combination of varieties from members who may have made field studies of both varieties. Our staff is engaged in additional studies on the subject and will be for the next two years.

Second Edition

of

ARIZONA'S CACTUSES

In December of 1950 we published Arizona's Cactuses with an edition of 4,000 copies which we thought would last us for all time. At this writing 25 copies remain.

The first edition was printed in Phoenix and we were hurried in getting it out with the inevitable result that many typographical errors were not corrected, some of the pictures were not as good as we had hoped and the print job was far from good.

The second edition contains only two very minor typographical errors that we can find and the poor pictures have been replaced by much better ones. The print job is excellent and was done by our regular printer, the Tempe News Press.

We have also included eight additional pages because of expanded text which brings our listing of the State's species and varieties right up to date.

Six new species are described and pictured as well as six new variations while two of the species in the first edition have been reduced to varieties based on further information.

Another important addition in the second edition is an index of common names. In the first edition many common names were included in the text but they were not indexed for ready reference. In the new book many additional common names are listed.

The second edition describes 64 species and 44 varieties for the State.

This second edition is respectfully dedicated to Reg Manning, Arizona's Pulitzer Prize Winning Cartoonist and past Chairman of the Board of our organization who has been of the greatest assistance to the Desert Botanical Garden since the present Director took office which wil be seven full years on Nov. 30th.

We are indeed fortunate in that we can hold our price to $1.00 for this new edition in the face of rising costs.

We have been greatly pleased by the reception of Arizona's Cactuses by the general public and feel that the new and enlarged second edition should be even more popular.

Another publication of the Garden our Self Guided Nature Walk has sold 35,000 copies in three winter seasons and we anticipate a sale of at least 15,-000 this winter.

We also anticipate that our attendance this season will exceed last year by at least 25,000 visitors because we are getting to be better known and our new McDowell Street entrance makes us much more accessible.

This increased attendance will necessitate new parking lots in the very near future as we have outgrown the present parking facilities.

On the following two pages we have reproduced two pages from the second edition of Arizona's Cactuses, showing two of the new illustrations and one new species and a new variety for the state.

Why Not

Arizona's Cactuses

As A Christmas Gift?

16D O. ERINACEA Eng. & Big. variety JUNIPERNA B. & R. Comb. nov.
O. Juniperina Britton & Rose 1919

Joints obovate, 10 to 12 cm. long or longer, broad, rounded at top, thick; forming clumps to 2 feet in diameter and one to two joints high; areoles small; spines all above the middle of the joint, one stout spine and one or more short accessory spines at upper-areoles, the long one up to 3 to 4 cm. long; flowers usually rose-colored; fruit dry, oblong, 3 cm. long, spineless.

In association with Juniper trees in the portion of Arizona north of the Mogollon Rim. Type locality Cedar Hill, San Juan County, New Mexico.

This variety is similar to but larger than variety rhodantha.

A few plants collected in the Navajo Reservation seem to be referable to Opuntia sphaerocarpa Eng. & Big. 1856. They have small orbicular joints which are strongly tuberculate and wrinkled when dry and the short acicular spines are borne only on upper areoles.

The fruit is sphaerical and without spines.

Fig. 24. *Opuntia erinacea* Eng. & Big. variety *Juniperina* (B. & R.)

16X. *OPUNTIA NICHOLII* Benson 1950

Low growing prickly pear forming groups up to 6 feet in diameter; stems egg-shaped—4 to 8 inches long, forming chains along the ground; spines about 4 to 7 to an areole, those from the upper areoles 1 to 2 inches long or longer, flexible, flattened, twisted, reddish when young becoming gray or white; flowers large, yellow or rose colored; fruits dry at maturity.

Rocky hillsides near Navajo Bridge where it is plentiful. We have had the plant under observation for six years and have felt

that it deserved specific rank so we're pleased to find Dr. Benson's publication of it.

Fig. 25. *Opuntia nicholii* Benson

17. *OPUNTIA FRAGILIS* (Nuttall) Haworth.
Cactus fragilis Nuttall 1818
O. brachyartha Engelmann & Bigelow 1856
O. fragilis brachyartha Coulter 1896
O. fragilis caespitosa Bailey 1916
O. fragilis tuberiformis Bailey 1916
O. columbiana Griffiths 1916

Small, prostrate prickly pear forming remarkably dense clumps up to 1 foot in diameter and 4 to 8 inches high; stems usually 2 to 5 jointed, the joints obovate or rarely nearly cylindrical, 1 to 2 inches long and about 1 inch wide; spines long, slender and tapering, 5 to 7 to an areole, brown; areoles filled with brown wool and yellowish glochids; flowers about 2 inches in diameter, pale yellow, fruit dry, spiny.

This species has a very wide range as it is found from Texas, New Mexico and Arizona through the mid west and northern states, northern California, Oregon, Washington and British Columbia where it extends north to the Arctic Circle.

Occasional plants are found with magenta colored flowers.

In Arizona it has been noted in grassland, juniper-pinon and yellow pine areas from Utah border southward to Hualpai Indian Reservation, at Williams and Heber and along the Puerco River.

The wide range of the species is possibly due to the easily detached joints which become attached by their spines to passing animals to be widely disseminated.

Desert Botanical Garden

Book Dept. P. O. Box 547 Tempe, Ariz.

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SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

DECEMBER, 1953

Feliz Navidad

y Feliz

y Prospero

Ano Nuevo

W. TAYLOR MARSHALL

W. HUBERT EARLE

E. R. BLAKLEY

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona, P.O. Box 547, Tempe. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $3.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. TAYLOR MARSHALL, Editor

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Volume 7 DECEMBER, 1953 No. 10

Table of Contents

Editorial and Board Meeting 111
Succulent Vines 112
A Tuberous Rooted Cactus 113
Two Rare Echinocerei 114
Melocactus Maxonii 117
Coloradoa 118
The Creeping Devil Flowers 119

Desert Botanical Garden of Arizona

STAFF

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Superintendent .....W. Hubert Earle
Curator of Herbarium ..... E. R. (Jim) Blakley

Garden open every day, except Monday, from 10 A.M. to 5 P.M.
No charge for admission.

Lectures — Each Wednesday and Thursday — 3:30 P. M.
Thursday lecture illustrated with Kodachromes.

EDITORIAL

The Garden staff all have a deep appreciation for the support from our membership during the past year and we desire to express to each of you individually our very best wishes for your happiness during the Christmas Season and for the forthcoming year of 1954.

We have expressed our feelings in the words of our Spanish neighbors to the south, recalling the early days of Arizona and the Spanish pioneers who made our wonderful State possible. Feliz Navidad y Feliz y Prospero Ano Nuevo, Happy Christmas and a happy and prosperous New Year.

W. Taylor Marshall
W. Hubert Earle
E. R. Blakley

BOARD MEETING

A joint meeting of the Executive and Advisory Boards was held in Webster Auditorium on Monday evening, November 16th to receive a report on the progress of the Garden and to plan future activities.

The membership of the Executive Board is listed on page 110 but a list of Advisory Board members has not previously been published and we list them now for the information of our membership.

Mrs. Alfred Alschuler
James J. Cahill
Mrs. Walter Douglas
Mrs. Charles Gilliland
Dave Henes
Mel Hinman
Mrs. H. R. Holcomb
Ross F. Jones
Sam Jones
Mrs. Homer Lininger
Mrs. Mildred May
Dr. James A. McCleary
Mrs. Bernard Rooney
Miss Eleanor B. Sloan
Jack Stewart

The director reported that attendance last season passed 125,000 and that the first two months of this season, October and November, were 23% ahead of last year.

The Boards were shown the newly finished beds and paths and the healthy appearance and rapid growth of the plants made during the past summer and the exact location of the proposed parking lots and reception building were pointed out.

The need of the Garden for Herbarium Cases for the storage of our more than 5000 herbarium sheets of desert plants was stressed and it has been suggested that an effort be made to interest the Foundations who have supplied such equipment to other needy Botanical Gardens and Universities.

Five cases are needed at $188.00 each and a microscope equipped for examination of plants which will cost approximately $500.00. Needed also are supplies such as herbarium sheets, species and genus folders and a manual hand press for preparing cactus specimens for drying. In all nearly $2000.00 is needed.

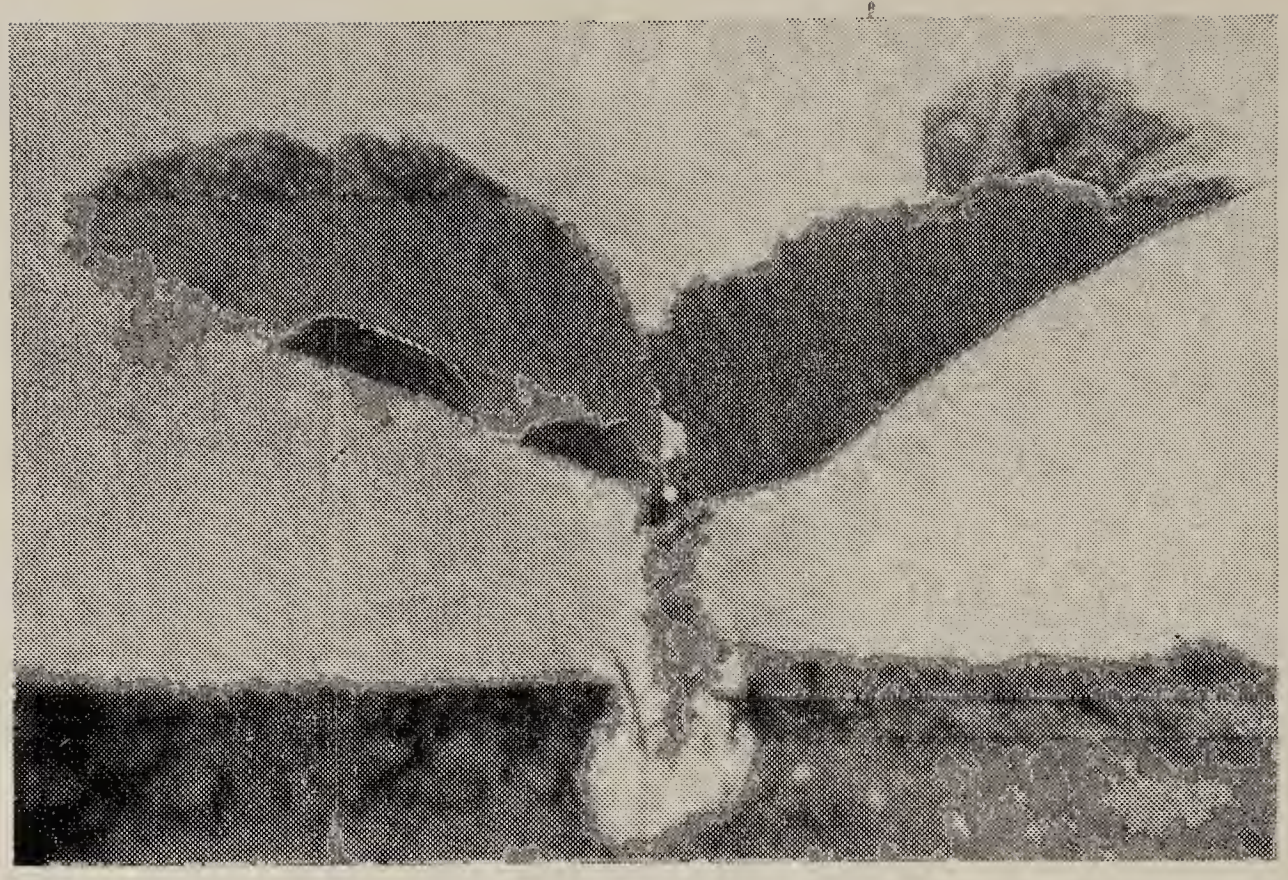
Plans for lights throughout the grounds and in the lath house have been prepared and we hope to do this work as soon as the cost of $350.00 is available so that we can offer evening lectures.

Our Boards decided that long range future plans for the Garden made an increase in our Trust Fund a necessity and a committee will be appointed to interest civic minded citizens and plant lovers to add to their wills a clause providing that the Garden be given a stated bequest after their death.

The greater the attendance, the more our cost of operation rises and each new building we add means additional upkeep. We confidently expect an annual attendance of 500,000 a year within the next ten years.

All gifts and bequests to the Garden are tax free and gifts can be deducted from income tax.

SUCCULENT VINES



Cissus juttae Dtr. & Gilg.
Staff photo

Members of the family Vitaceae, the vines, are, in normal rainfall regions, climbing vines the best known of which are the grapes.

However under desert conditions we find members of the vine family acquiring the ability to store food and water in their stems and hence considered as stem succulents.

The cactus-like vines are native to the deserts of the south and southwest Africa and have thick, club-shaped stems, in one species, Cissus cramerianus, up to 12 feet tall, at which time it greatly resembles Idria columnaris, the succulent ocotillo from Lower California.

Aside from their novelty our three species of Cissus will be valuable in our class work as examples of adaptive morphology.

Cissus cramerianus Schinz is native to S. W. Africa and as above mentioned can attain a height of 12 feet. It has pale yellow bark which falls off in age in papery strips. Later, short, thick interlaced branches will bear the tripartite leaves which in this species are stalked and covered with fine felt.

Cissus juttae Dtr. & Gilg. is also from

Cissus cramerianus Schinz
Staff photo

S. W. Africa and our plant can be expected to attain a height of six feet. In general appearance it now resembles C. cramerianus except that the leaves are not stalked and are shining green not covered with felt but the veins on the lower surface are strewn with strong, translucent hairs.

Cissus quadrangularis L. is from south and tropical Africa and is a climbing shrub with 4 angled branches which are green and bear a heavy wax coating; the leaves with 3 lobes at each node during growing season and with a tendril opposite each leaf by which the vine attaches to trees or rocks.

This species and a similar one, Cissus cactiformis Gilg. are very interesting and especially so in view of the resemblance to a species of succulent geranium, Pelargonium tetragonum of which we will have a report in a future Bulletin.

Our plants of Cissus were obtained from the Botanical Garden of the University of California at Berkeley who grew them from seed. C. cramerianus came to us as a species and was identified by our staff.

Jacobsen in his book "Succulent Plants" says that the succulent species of Cissus, when grown in Europe, make their new growth in winter at which time they need water in moderation. In summer they are kept entirely dry.

Cissus quadrangularis L.
Staff photo

Just what cultural requirements will obtain in our dry, hot climate is a matter for experimentation and the uncertainty of their requirements here make for a greater interest for us.

A TUBEROUS ROOTED CACTUS

In September 1952—the Moortens, Slim and Patricia brought to us a peculiar tuber which they had collected near Tehuantepec, Mexico where it was associated with scrub Oak, Lemaireocerus weberi and Melocactus oaxacensis in a loam and granite soil.

Of the several tubers collected by them one had a branch still attached and the stem resembled some species of Nyctocereus. Our tuber was very dry and had been injured in transit but it was planted by us in sandy loam and in the following spring grew a branch.

This summer the Moortens again collected the species and presented the Garden with the four tubers shown in our illustration, the largest of which was 18 inches long. Two of these four tubers had branches.

The Moortens reported that the stems were not erect but arched and flower remains noted indicated a flower of 3 inches length or less, white and with spine clusters on both ovary and tube. This checks well with the description of stems of Nyctocereus guatemalensis B. & R.

Howard Gates who collected stems of a plant near the location of the Moortens collection (but did not check the root structure) identified his cuttings as Nyctocereus oaxacensis B. & R. a species published in Cactaceae Britton &

Rose II:120:1920.

N. oaxacensis was described without mention of roots but it is keyed as having flowers over 9 cm. long (4 inches) while the flowers observed by the Moortens were about 3 inches. The description of N. oaxacensis calls for branching stems, slender, which does not fit our plant.

We can only tentatively identify these tubers as N. guatemalensis or an undescribed species and determination must await flowering.

N. guatemalensis was described by Britton & Rose in Contr. U.S. Nat. Herb. 16:240.1913 and I have the original publication before me as I write. The descriptions are based on collections by Maxon at El Rancho, Guatamala but additional collections by Deam at El Rancho and by Eichlam without definite location are noted. Tehuantepec is not far from the Guatemala border.

Accompanying the publication are three plates showing a branch in flower, life sized, and the flower measured 3¼ inches. Two other plates show the arching, creeping and prostrate stems of two colonies of the plant which agrees with the growth habit of our specimens.

If our plant is indeed Nyctocereus guatemalensis then we can only conclude that Maxon, Deam and Eichlam all missed the decided character of the tuberous root.

This plant gives us material for speculation and we are deeply indebted to the Moortens for supplying such an intriguing problem.

Tubers of a cactus.
The longest 18 inches long. This possibly may be Nyctocereus guatema l ensis.
Staff photo

TWO RARE ECHINOCEREI

In our last issue we spoke of two species of Echinocereus collected by J. Whitman Evans and presented to the Garden by him; neither of the species are in general supply but both are interesting.

Echinocereus palmeri B.&.R. was described from a specimen collected by Dr. E. Palmer on a small hill near Chihuahua City in April 1908. Only three specimens were seen of which one was in flower.

The plant is small, 2 or 3 inches high and about 1 inch in diameter, of flabby texture and very dark to bronze in color. The spines are needle-shaped and 12 to 15 radial spines dark in color and black tipped come from each areole

Echinocereus palmeri B. & R.
A plant collected near Chihuahua City
by J. Whitman Evans. Staff photo

with one longer central spine which in our specimens are black.

The flower is 1½ inches long and as broad when open and is bright magenta in color.

The stems are erect up to 2 inches tall and then lean as the stem elongates.

In winter or when dry the color of the plant is bronze which sets off the dark to black spines to make E. palmeri a most attractive species.

The second species of Echinocereus collected near Chihuahua City by Mr. Evans is one that was described in 1848 by Dr. George Engelmann in Memoirs of a Tour of Northern Mexico by Dr. Wislizenus as Echinocereus adustus. Later it was reduced to a variety of E. pectinatus by Schumann.

The juvenile form of this plant, at which time no central spines are present, would suggest its affinity with E. pectinatus but later, when the long central spines develop it exactly resembles a plant described by Britton & Rose as Echinocereus standleyi from plants collected in the Sacramento Mountains of New Mexico by Mrs. S. L. Pattison.

A search of the "Memoirs of a Tour of Northern Mexico" by Dr. Wislizenus for which Dr. Engelmann provided the plant descriptions descloses that Dr. Wislizenus collected four types of Echinocereus between Chihuahua and Cosehuiriachi of which Dr. Engelmann writes:—

"One of the latter (Echinocerei) is completely covered with stout and long spines; (28) another has short radiating spines, closely adpressed to the plant; (29) a third has short radiating spines, with a single stout, black, central ones, which project from the plant in all directions; (30) a fourth, is distinguished by its longer and curved reddish radiating spines, with a stouter one projecting from their center (31)."

In the footnotes (28) is called Echinocereus polyacanthus with a latin description. This is our present E. triglochidiatus var. polyacanthus.

Number (29) Echinocereus adustus is described as egg-shaped, 1½ to 4 inches high with 13-15 ribs; areoles lance-shaped, almost meeting each other, at first white wooly; radial spines 16-18, flattened against plant body in comb arrangement; the apex of the spines brownish; all needle-shaped and with no central spine.

Number (30) Echinocereus radians is described as similar to E. adustus except that it has a single central spine extending directly outward to the plant body which is robust and brown or black.

Number (31) is described as similar

to E. radians but with reddish spines. No flowers or fruit were known at the time of the publications.

The last three (29, 30, 31) have been considered conspecific by later botanists. Schumann in 1898 reduced them to varieties of E. pectinatus. Unquestionably the three descriptions apply to a single species but no late writer has amended the description to include the changing phases of the spination of this species. We therefore give a description based on our plants and those in the collection of J. Whitman Evans as follows:

ECHINOCEREUS ADUSTUS Engelmann in Wislizens Mem. Tour N. Mex. 104.1848

Echinocereus radians Engelmann in Wislizens Mem. Tour N. Mex. 104.1848

Echinocereus rufispinus Engelmann in Wislizens Mem. Tour N. Mex. 104.1848

Cereus adustus Engelmann in Gray Pl. Fendl. 50.1849.

Cereus rufispinus Engelmann in Gray Pl. Fendl. 50.1849.

Cereus pectinatus armatus Poselger, Allg. Gartenz 21:134.1853.

Cereus pectinatus spinosus Coulter, Contr. U.S. Nat. Herb. 3:387.1896

Cereus adustus radians Coulter, Contr. U. S. Nat. Herb. 3:387.1896.

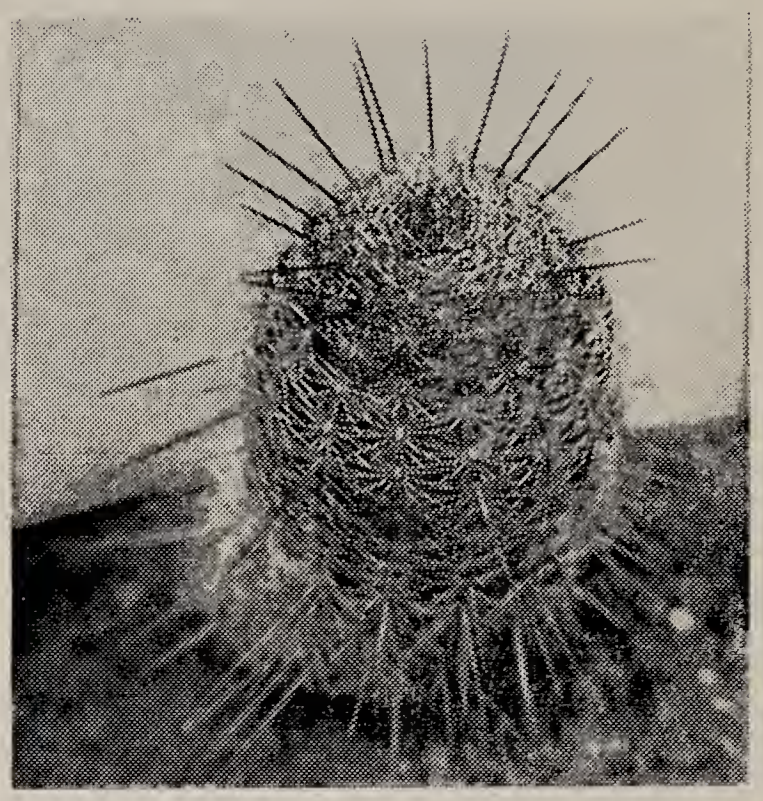
Echinocereus pectinatus adustus Schumann, Gesamtb. Kakteen. 271.1898.

Echinocereus pectinatus armatus Schumann, Gesamtb. Kakteen. 271. 1898.

Echinocereus pectinatus rufispinus Schumann, Gesamtb. Kakteen. 272. 1898.

Echinocereus standleyi Br. & R. Cactaceae III:24.1922?

Plant hemispheric to columnar, 1½ to 8 inches tall, 1½-2 inches in diameter; ribs 11 to 15; areoles elongated, approximate, at first white wooly; radial spines 16 to 20, in comb formation, appressed to the plant body but at other growing periods the same plant may produce single, porrect centrals up to 1 inch long and dark reddish-black to black; flowers magenta to deep rose, up to 2 inches long or longer the petals narrow and showing deeper color at their mid vein; ovary and tube covered with clusters of short brown, acicular spines and long wool.



Echinocereus adustus Engel. Also collected in Chihuahua by J. Whitman Evans. Staff photo

The alternation from the pectinate spine form to the form with long, porrect centrals seems to occur each season so that an old plant is cylindrical with alternate sections with and without central spines as shown in our illustration.

Echonocereus standleyi is possibly conspecific as suggested by Britton and Rose at the time of publication where they say:—"It is a little known species resembling Echinocereus adustus and E. viridiflorus but with different spines; neither flower nor fruit has been obtained."

The Sacramento Mountains of New Mexico are near enough to Chihuahua to make an extension of range for E. adustus to that location possible. It is also true that several forms of E. viridiflorus are found in this mountain range.

Much material must be collected in the Sacramento Mountains to solve the taxonomic position of E. standleyi and we hope to tackle this problem next summer.

MELOCACTUS MAXONII

The genus Melocactus is notable for its absence from most collections despite the fact that species of this genus are unique in appearance.

Melocactus and Discocactus are the two genera in the Cactus family which produce a separate structure from which the flowers and fruit arise. This structure, called a cephalium, consists of a woody core supporting dense wool with spines projecting through it. The small but colorful flowers show through the wool and the fruit projects from it when fully ripened as shown in our illustration.

Melocactus maxonii Rose comes from Guatemala but we have Melocactus oaxacensis from Southern Mexico, Melocactus broawayi from Tobago Island in the West Indies and Melocactus caesius from Venezuela in our collection.

In some species, notably Melocactus intortus from Porto Rico and the Virgin Islands, the cephalium has been known to be as long as the plant body and 12 inch cephaliums are fairly common in this species.

Without its cephalium any species in this genus could be mistaken for a species of Ferocactus (barrel cactus), and juvenile plants are often mistaken for a barrel cactus but when the cephalium is formed no confusion is possible.

Melocactus maxonii Rose
Staff Photo

All of the species are found in the tropics and their culture is somewhat difficult in our colder climate.

CORRECTION

The correct citation for the title of upper photo in your bulletin of Nov. 1953, p. 101, is **Copiapoa humilis** (Philippi) Hutchison (in Cact. & Succ. Jour. Amer. 25 (2): 34, 1953.) Not (Philippi) Brit & Rose, who never made such a combination.

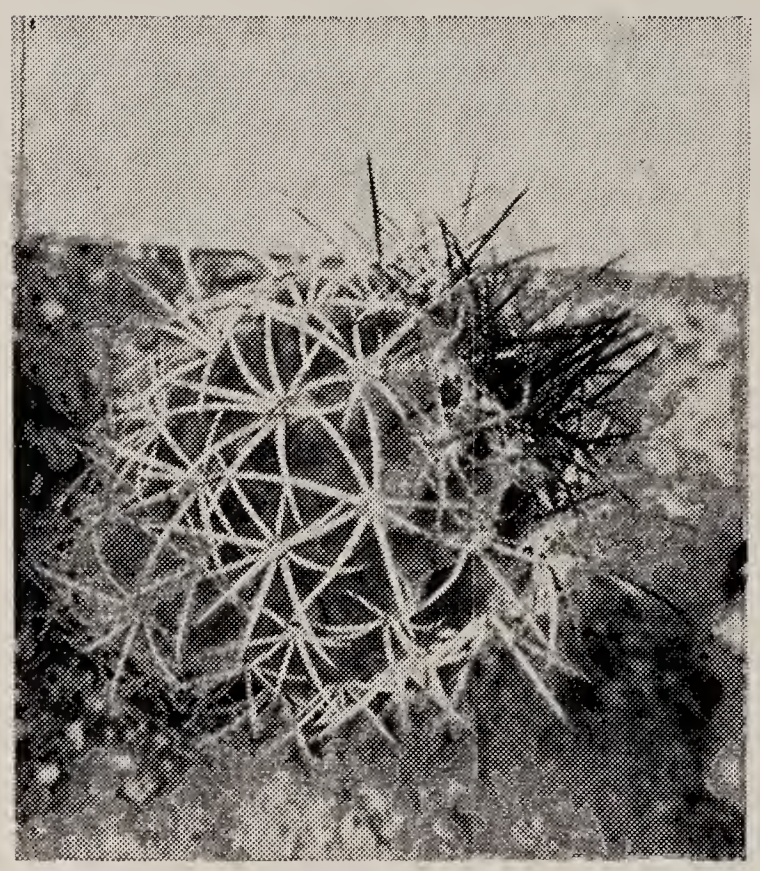
P. C. Hutchison

MORE ON COLORADOA

A three day trip to the four corners was made late in September by Jim Blakley of the Desert Botanical Garden, Alan Blackburn of the Tucson Trailside Museum, John Hales and myself. We primarily wanted to determine if the range of these plants extends into Arizona.

We left Phoenix at 5 P. M. and arrived near Cortez, Colo., at 5 A. M. after driving all night. It was pretty cold and we started our hunt, with flashlights, long before sunrise. Several plants were found but after a much needed breakfast we failed to re-locate the spot which we found in the dark. Several large plants which I had located on our previous trip were missing which was regrettable since mature Coloradoas do not survive transplanting.

The trip through Shiprock into Arizona proved a failure since a tire blew out on the very rocky road and we decided not to make the last 40 miles without a spare. At the location of the blowout we prospected extensively for several hours but found no Coloradoas. This location is about 7 miles from the Arizona line, but Blakley found several large amonites which he and Blackburn removed from the matrix in which they were embedded. This loaded the car rather heavily and we returned to safer roads.



Copiapoa coquimbana.
Another of this interesting Chilean genus which was described in the November Bulletin. This is a seedling of 8 years. Staff photo

Prospecting deep into New Mexico produced 2 Coloradoas which had very long spines and which were taken for the Botanical Garden. However, our hope for a new variety proved unfounded when we later found the intergrading plants which provided the gradual change in spine form.

A hunt near Holbrook, Ariz., for Toumeya peeblesiana produced no results. This plant is very small and only about 18 specimens have ever been found, only one in the last 10 years. But a small globose variation of Sclerocactus Whipplei, usually less than 1½ inches in diameter made us feel that the day had not been wasted.

South of Showlow we searched for Toumeya papyracantha but found the country badly overrun with livestock. Only one specimen was found and this was given to Blackburn for the Tucson collection.

It was confirmed that Coloradoa is strictly confined to very localized soil condition and never was found associated with weeds or grass. A number of native shrubs, flowers and weeds were collected by Jim Blakley for the Garden's herbarium and as a whole the trip was considered by all of us as successful.

—Chas. Mieg.

THE CREEPING DEVIL FLOWERS

Machaerocereus eruca the Caterpillar Cactus
In bud in our Garden. Staff photo

The creeping devil or caterpillar cactus is found only on the Magdalena plains of Lower California, Mexico, but it delights in the climate of Arizona and our plants have grown to a very large group, prostrate on the ground, with the stems heading in all directions.

Perhaps because our plants grow so fast they have proved themselves very shy bloomers.

Therefore we were delighted when a bud appeared on one of the plants. We photographed the bud and awaited the opening of the flower. Each night we went out about 10 P. M. to see if the bud was opening.

We now know that the bud opened about midnight and was closed and wilted by 6 A. M. the following morning. We missed seeing it. Next time we will know better and plan to stay up all night if necessary to see and photograph the flower.

Oh yes! The botanists call this plant Machaerocereus eruca.

Desert Botanical Garden

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